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# The impact of risk retention on the pricing of securitizations

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## Abstract

Loan screening and monitoring are critical to loan performance, but incentives are diminished for securitized loans. Risk retention is intended to harmonize the interests of originators and investors; however, it is unclear to what extent investors anticipate and respond to originators' screening and monitoring incentives, particularly with respect to different types of risk retention. The theoretical literature suggests that equity retention is optimal in terms of screening efforts; thus, if investors anticipate these incentives, equity retention should lead to low credit spreads. Employing OLS and instrumental variables regressions, we empirically examine the effect of retention on spreads. Our analysis, based on a unique dataset of securitizations, reveals that the effects highly depend on the considered investment type. Credit spreads decrease by approx. 26 to 39 bps if the originator retains a material fraction of at least 5% of the deal's nominal value. For tranches with high information sensitivity—where screening and monitoring incentives are most critical—investors, though, impose an additional risk premium of 120 basis points when originators fail to retain a substantial portion of the securitizations. In addition, we find that transactions with vertical slice retention are associated with a notably higher risk premium than those with equity retention, demonstrating the differential impact of retention structures on investor perceptions. Overall, our results underline that the extent of asymmetric information, particularly with respect to different types of investments and risk retention, is an important component in the pricing of securitizations.

**Keywords** Security design · Asset-backed securities · Retention · Credit spreads

**JEL Classification** D82 · G01 · G21 · G24

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## 1 Introduction

Theory suggests that pooling and tranching of securitizations are essential mechanisms to mitigate problems of asymmetric information (DeMarzo, 2005). Optimal security design implies retention of the first loss tranche by the originator (“*equity retention*”), maximizing screening and monitoring efforts. However, in real-world securitizations many originators have utilized the originate-to-distribute (OTD) model without retaining a share of the transaction. Consequently, originators may conduct less rigorous *screening* if they know that they can sell loans through securitizations without participating in later defaults. Moreover, originators have diminished incentives to *monitor* borrowers after selling the loans. The high practical relevance of screening and monitoring incentives for securitizations has been demonstrated in the context of the subprime crisis, which was significantly influenced by the OTD model. The empirical literature on pre-crisis securitizations indicates that low-quality loans were securitized and that securitization led to reduced screening incentives (Keys et al., 2010; Purnanandam, 2011; Titman & Tsyplakov, 2010; Griffin & Maturana, 2016), confirming the theoretical arguments. However, it is unclear to what extent investors or originators bear the costs of low screening and monitoring incentives. In particular, after the subprime crisis, it is plausible that investors anticipate reduced incentives for originators, which leads to higher credit spreads if information asymmetry is high, resulting in lower profits for originators. Against this background, our main research questions are: *Do investors take asymmetric information into account when pricing securitizations? What type of retention do investors prefer, and how does this translate into different levels of risk premiums? Do different types of investors have different preferences for mitigating incentive problems?*

Using European securitization data spanning 2009–2019, our findings substantiate that investors significantly factor in asymmetric information when pricing securitizations. Specifically, when the originator retains at least 5% of the deal, the risk premium decreases by 26–39 basis points (bps), reflecting investor confidence in retention-driven screening efforts. For information-sensitive tranches, where screening and monitoring incentives are most critical, investors even demand an additional risk premium of up to 123 bps if originators of mortgage-backed security (MBS) deals fail to retain a substantial share of the deal. These results are confirmed through our instrumental variable (IV) approach, following the methodology established by Ashcraft et al. (2019). Importantly, the study reveals that not just the presence, but also the type of retention plays a pivotal role in determining the risk premium. Consistent with theoretical arguments, investors of information-sensitive tranches demand a substantially lower risk premium in the case of equity retention than in the case of “*vertical slice retention*”, i.e. an equally weighted retention of each issued tranche.

This study makes several key contributions: Firstly, to the best of our knowledge, this is the first study to analyze the impact of the EU minimum retention requirements on credit spreads. Secondly, our findings demonstrate that investors proactively anticipate originators’ screening and monitoring incentives and

choose the required risk premium based on the degree of asymmetric information. Thirdly, we provide insights into the magnitude of the risk premium due to asymmetric information for securitizations. Fourthly, we find that the magnitude of the premium for asymmetric information strongly depends on the specific type of investor or the specific tranche. Overall, this research enhances the comprehension of how investors perceive and assess asymmetric information in securitizations. Our results underline that the extent of asymmetric information is an important component for the pricing of securitizations.

The paper is organized as follows. Section 2 reviews related literature. Section 3 develops hypotheses on the impact of information asymmetry on the risk premium of securitizations. Section 4 describes our data set and Sect. 5 presents results concerning the introduction of minimum retention requirements. Section 6 compares different retention types, and Sect. 7 concludes.

## 2 Related Research

The theoretical literature discusses the relevance of asymmetric information in securitizations extensively. Theory suggests that pooling, tranching, and retention are important features to reduce costs of asymmetric information. If the market consists of informed and uninformed traders, there are benefits of pooling loans before originators sell them since this leads to a reduction of the adverse selection problem of uninformed traders (Subrahmanyam, 1991; Gorton & Pennacchi, 1993). However, the pooling destructs information because the informational advantage of informed investors diminishes. Against this background, it can be beneficial to split the pooled loans in information-sensitive and insensitive tranches. Thus, informed investors can still profit from their informational advantage and remain in the market (Boot & Thakor, 1993). However, it is not only important to consider asymmetric information between investors but also private information of the originator about the quality of the loans.

Focusing on asymmetric information between originators and investors, it can be beneficial for originators to signal a high quality of pooled assets by retaining a portion of the issue, the equity tranche (DeMarzo & Duffie, 1999). The above-mentioned information destruction effect of pooling is nevertheless a problem, so that in this setting the originators can also benefit if they sell assets separately instead of pooling them to attract informed investors. However, pooling also has a risk diversification effect, which allows to issue a highly information-insensitive tranche. Due to this effect, a combination of pooling and tranching can indeed be optimal if originators retain the information-sensitive tranche (DeMarzo, 2005).

Additionally, theoretical literature regarding retention suggests that the originator has skin in the game if it retains the equity tranche, which may improve incentives or even be a close approximation of the optimal security design (Hartman-Glaser et al., 2012; Chemla & Hennessy, 2014; Vanasco, 2017). Nevertheless, models show that a flat-rate retention is socially suboptimal because of its information destruction effect (Guo & Wu, 2014; Vanasco, 2017). Instead, the originator can signal a high quality of the securitized loans with the extent of retention (Hartman-Glaser,

2017; Vanasco, 2017). Moreover, the theoretical literature suggests that ratings in their capacity as public information increase wealth by reducing costly retention but also reduce loan quality (Daley et al., 2020).

The theoretical literature which focuses on the benefits of different types of retention is scarce though. Comparing retention of the equity tranche, the mezzanine tranche, and vertical slice retention, the screening effort is generally maximized if originators retain the equity tranche. Only if the probability of downturn is high (implying the equity tranche to likely default) and if the mezzanine tranche or vertical slices are quite thick, these types of retention can dominate the equity retention (Fender & Mitchell, 2009). In addition, choosing vertical slice retention instead of equity retention might be an attempt of the originator to limit the level of its skin in the game (Krahnen & Wilde, 2022).

Despite the theoretical arguments regarding reduced screening incentives (see also Pennacchi, 1988; Parlour & Plantin, 2008), many originators practiced the OTD model without retaining a significant share in the pre-crisis period. In retrospect, it has proved true that the OTD model indeed led to lax screening of subprime mortgage loans (Keys et al., 2010) and to the origination of low-quality loans (Purnanandam, 2011). Additionally, for collateralized loan obligations (CLOs), banks with access to the securitization market have lower monitoring incentives (Wang & Xia, 2014). Moreover, borrowers, whose loans are sold in the secondary market, performed significantly worse than their peers (Berndt & Gupta, 2009), confirming the theoretical arguments. These findings are particularly valid for originators which have performed poorly before origination because reputational concerns are hardly taken into account by them (Titman & Tsyplakov, 2010). There seems to be a negative connection between reputation and the retention amount: the longer an originator is active in the securitization market, the thinner is the retained equity tranche, which is in line with reputational concerns (Albertazzi et al., 2015).

Securitizations seem to induce further incentive problems. Despite loan modifications can reduce average losses in securitizations (Maturana, 2017), securitized mortgages are less likely to be renegotiated and more likely to default than other mortgages (Agarwal et al., 2011; Kruger, 2018). Besides, during the 2000s misreported securitized loans were substantially more likely to become delinquent than correctly reported loans (Griffin & Maturana, 2016). For CLOs, though, the performance of securitized loans was not substantially different from unsecuritized loans. The reason might be that the underlying loans of CLOs are typically syndicated at origination, which implies that the originator retains a material fraction of the underlying loans (Benmelech et al., 2012).

Empirical research also underlines that the extent of retention can be interpreted as commitment to monitoring assets even though they are securitized (Albertazzi et al., 2015). Consistent with that finding, there is a negative relationship between time to sale of securitized mortgages and their probability of default. Therefore, delaying the sale of mortgages into securitization is a signal of loan quality (Daley & Green, 2016; Adelino et al., 2019). Furthermore, first loss pieces receive higher cash flows if a deal is more complex. Hence, one can argue that originators holding the first loss piece and investors of information-sensitive tranches can profit from deal complexity (Ghent et al., 2019). If the originator is affiliated to the sponsor,

securitized mortgages tend to default less frequently, yields of MBS are lower and credit enhancements are stronger (Demiroglu & James, 2012).

Recent literature shows that retention leads to superior loan performance (Furfine, 2020) and to reduce losses (Begley & Purnanam, 2017; Agarwal et al., 2024; Ashcraft et al., 2019; Flynn et al., 2020). The EU demands comparable standards for risk assessment in securitizations and balance sheet loans. However, the EU does not regulate the originators' behavior after securitization, which leaves decremental freedom for moral hazard (see Art 408 CRR (EU) No. EU, 2013a, 2013b/575 and Art. 52a AFM RL (EU) No. 2013/231). Only with the enactment of the EU securitization regulation in 2019, the regulation shifted from ex ante credit risk to performance after securitization (Art. 6 Securitization Regulation (EU) No. 2017/2402, Hibbeln & Osterkamp, 2024a). In the absence of a regulation for moral hazard after securitization, however, retention is the only mechanism that improves the originators' incentives and ensures appropriate behavior. Particularly, retention improves monitoring and the handling of non-performing (NPLs) and defaulted loans (Hibbeln & Osterkamp, 2024b).

The most closely related papers to ours are by Flynn et al. (2020) and Begley and Purnanandam (2017). Begley and Purnanandam (2017) argue that an above-median amount of a retained equity tranche decreases yield spreads and helps to improve the pool's performance and default rates. However, there are several differences to our approach. They examine the relationship between retention and spreads based on a pre-crisis US data set from 2001, 2002 and 2005 consisting of 379 deals, whereas we analyze a post-crisis data set with 3251 tranches of European securitizations from 2009 to 2019, containing the introduction of the EU minimum retention requirements. While they focus on equity retention, we take other retention types into account and differentiate between the impact on information-sensitive versus insensitive tranches. They observe much lower amounts of retention (mean 1.25% and median 0.75%).

Flynn et al. (2020) establish a theoretical model, which suggests that spreads are lower in deals with equity retention and confirm the results empirically. While they only focus on US deals in 2017 and 2018, we establish an IV approach to provide further evidence on the effect of retention on spreads.

There are some further related analyses in the context of syndicated loans. A syndicated loan is originated by a lead bank that is responsible for ex-ante due diligence and for ex-post monitoring of the borrower. Due to the large loan amount, the lead bank retains only a fraction of the loan whereas the rest is sold to other participant banks. The reduced degree of ownership results in incentives to syndicate low quality loans and to reduce monitoring effort. The empirical literature supports this argument as a smaller lead share, which implies increased information asymmetry between the lead and participant banks, results in a higher risk premium demanded by the participant banks (Gorton & Pennacchi, 1995; Ivashina, 2009). The situation is very similar to securitizations with vertical slice retention because in both situations the lead investor has to bear a fixed percentage of losses. However, for syndicated loans the asymmetric information effect of the lead share on loan spreads is opposed by a diversification effect as a higher retention implies an increased concentration risk. On the contrary, for securitizations there is no opposing diversification

effect because the retained fraction does not relate to a large single loan but to a pool of smaller loans. Thus, for securitizations it is more straightforward to measure the effect of asymmetric information.

### 3 Hypotheses development

As supposed by the literature, we expect that ownership is an important mechanism for inducing screening and monitoring incentives (see also Leland & Pyle, 1977). If investors anticipate low incentives, they demand a risk premium for asymmetric information, so that credit spreads are high in these situations. Thus, we expect that credit spreads are lower if the originator retains a material share of the securitization. Decomposing this relationship, we expect a stronger effect of retention on credit spreads for information-sensitive tranches because an originator's skin in the game and harmonized interests are more relevant to those investors. Digging deeper into this effect, we first implement an IV approach based on the instrument of Ashcraft et al. (2019). Some originators have access to both, deals with and without retention, at the same time. Thus, they can decide to securitize undesired exposures into deals without retention, so that they do not have skin in the game. In other words, if an originator issues a deal with retention, and if it has access to deals without retention at this time, the originator can select the higher-quality loans for the deal with retention. As a consequence, this leads to lower risk in the deal with retention. We therefore expect spreads to be lower if the access to deals without retention is easy.

However, there are different types of retention, particularly equity and vertical slice retention, which possibly lead to different incentives for originators. As mentioned above, the theoretical literature finds that equity retention should lead to a maximization of screening and monitoring efforts. This only seems plausible as long as we consider incentives in an unconditional framework, though. Whereas it seems not be of great importance to distinguish between normal market and downturn scenarios for single loans, it is highly relevant for securitizations. Due to the tranching of securitizations, there are very different investment opportunities, e.g., investors can buy information-sensitive or information-insensitive tranches, which have a very different sensitivity to the state of the economy. In a normal state of nature, the probability of default of AAA tranches is very unlikely; the risk of these tranches is mainly systematic so that a default of these tranches typically only occurs in economic downturns (Coval et al., 2009).<sup>1</sup> However, if we focus on situations of economic downturn scenarios, the equity tranche is very likely to default completely. Thus, incentives of originators are very low when the impact of monitoring is most relevant from the perspective of AAA tranches. On the contrary, if originators choose vertical slice retention, they still have incentives to monitor the underlying loans, even in situations where many loans and, thus, the equity tranche defaulted because they maintain skin in the game. Consequently, equity retention seems to be favorable regarding screening incentives on the one hand, but vertical slice retention

<sup>1</sup> Due to this finding, Coval et al. (2009) call these securities "economic catastrophe bonds".

appears favorable regarding monitoring incentives from the perspective of AAA investors on the other hand. Summing up, which effect is more relevant for investors of information-insensitive tranches, and therefore which type of retention these investors prefer is unclear. These considerations lead to the following hypotheses:

**H1** Credit spreads are lower if a material fraction of the securitization is retained by the originator.

**H2** The effect of information asymmetry on credit spreads is higher for information-sensitive tranches than for information-insensitive tranches.

**H3** Credit spreads are lower if the originator has access to no-retention-deals, in which it can put unwanted credit risk without having skin in the game (IV approach).

**H4** For information-sensitive tranches, credit spreads are lower if the originator chooses equity retention instead of vertical slice retention.

**H5a** For information-insensitive tranches, credit spreads are lower if an originator chooses equity retention instead of vertical slice retention due to screening incentives.

**H5b** For information-insensitive tranches, credit spreads are higher if an originator chooses equity retention instead of vertical slice retention due to monitoring incentives.

## **4 Data**

Subsequently, we first describe the sample and the criteria for exclusion of data. Then, we explain the measurement of relevant variables including regulatory retention requirements. Finally, we present summary statistics of our data set.

### **4.1 Sample selection**

The data considered in this study rely on different sources. ConceptABS delivered data on European securitizations. These data contain deal and tranche level information, as well as ratings of the rating agencies Standard & Poors, Moody's, Fitch and DBRS. Sovereign ratings are directly obtained from Standard & Poors, Moody's, Fitch. For one of our main variables, the type of retention, we use hand-collected data from the respective investor prospectuses, which we obtain from asset backed security (ABS) data providers and Bloomberg. One major advantage of using these data is the visibility of the influence of minimum retention requirements of the EU, which have come into effect on January 1st, 2011. As a consequence, the data from 2009 to 2010 contain a significant share of deals with no relevant amount of retention (or at least a potential retention is not apparent for the investors). On the



contrary, issues after January 1st, 2011 mostly include one of the permitted types of retention. The advantage of using European data is that we have a rich sample with observations with retention, which improves estimation results. Another advantage is that the originator usually clearly reports information about retention in the prospectus due to the regulatory rules and the respective data are more consistent leading to high data quality.

We focus on floating rate ABS and MBS tranches and exclude collateralized debt obligation (CDO) deals because CDOs are actively managed and therefore the interest rate reflects not only the risk of the underlying assets but also the ability of the CDO manager in selecting undervalued tranches. The initial data set consists of 4278 floating rate ABS and MBS tranches. We exclude all tranches where the prospectus is not available because important data are missing. After this data cleaning, we have a final sample of 3251 tranches from 1016 deals. The total nominal value of these tranches is € 1322 billion.

## 4.2 Variable measurement

### 4.2.1 Retention

We extract the information about retention directly from the prospectuses. As the regulatory rules heavily influence the retention data, we briefly present the retention requirements subsequently. The rationale behind the discussion to establish retention requirements is to “provide a sponsor with an incentive to monitor and control the quality of the assets being securitized and help align the interests of the sponsor with those of investors in the ABS” (SEC, 2012),<sup>2</sup> and is thus in line with the theoretical literature. However, this does not mean that the literature implies the necessity of regulatory rules since it is possible that originators voluntarily choose retention as a consequence of investors who anticipate differing interests.

The minimum retention requirements of the EU were first formulated in Article 122a of the Capital Requirements Directive (CRD) and have come into effect on January 1st, 2011. Due to these rules, a European institution is only allowed to invest into a securitization position if the originator (or sponsor or original lender) has disclosed that it will retain a material net economic interest of at least 5% of the nominal value of the securitization. Thus, the regulatory rules do not imply that European originators have to retain a material net economic interest but ignoring these requirements means that European institutional investors are not allowed to invest in these securities. Consequently, these rules are also relevant for originators outside the EU. However, some deals originated after 2011 are still without retention. Article 405 of the Capital Requirements Regulation (CRR (EU) No. 575/2013) replaced Article 122a CRD in 2013 and complemented an additional retention type. Since 2019, Article 6(3) of the European securitization regulation has defined the retention requirements. There are 5 permitted types of retention:

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<sup>2</sup> This argument is mentioned in the regulatory US and European documents.

- (a) *Equity*: Retention of the first loss tranche and, if necessary, to achieve at least 5% retention of the nominal value on an ongoing basis, other consecutive tranches.
- (b) *Vertical slice*: Retention of at least 5% of every single tranche that is sold to investors.
- (c) *Seller's share*: Retention of at least 5% of the nominal value of the pooled revolving assets. This option is mainly relevant for revolving master trust structures.
- (d) *Random selection*: Retention of at least 5% of the nominal amount on the basis of randomly selected assets that would otherwise have been securitized in the securitization. This option is only allowed if the potential securitization consists of at least 100 assets at origination.
- (e) *First loss retention of every exposure*: Retention of at least 5% of the first loss of every securitized exposure.

In the United States, the regulators permit a so-called L-shaped risk retention besides equity and vertical slice retention. This is a combination of equity retention (horizontal component) and vertical slice retention (vertical component), both together at least 5%. The European Banking Authority (EBA) discussed the introduction of the L-shape retention for the EU; though, the EBA advised against its introduction due to a lack of effectiveness and a complicated implementation for originators (EBA, 2016).

European ABS prospectuses are written in English or in Spanish. In most cases, we find information about the retention in the deals' prospectus with the following key words: retain, retention, subordinated loan, 122a CRD, 405 CRR, and Art. 6(3). For Spanish prospectuses, we also use the key words *retendrá*, *retención*, *préstamo subordinado*, Real Decreto 771/2011, *reglamento 575/2013*. Based on these data, we generate two variables: On the one hand, we obtain an indicator variable retention that indicates whether the originator retains a material fraction of the transaction or not. On the other hand, we create a variable containing the concrete type of retention, e.g. equity or vertical slice retention. To have consistent data before and after the introduction of the minimum retention requirement, we assume that an originator has a material net economic interest only if it retains is at least 5%. If there is no information about retention in the prospectus or if the retention is less than 5%, we assign the category "no qualified retention".

#### 4.2.2 Tranche level and deal level variables

Begley and Purnanandam (2017) consolidate variables (weighted by tranches' volume) on deal level. Our level of analysis, however, is the tranche level. They argue that most effects are captured by rating class and sponsor fixed effects, which seems to be true for the pre-crisis period (see also Fabozzi & Vink, 2012). Nevertheless, in the post-crisis period, investors take also other factors into account, or re-adjust the weighting of factors that are already included in credit ratings. We find that our subsequently described control variables improve the explanatory power of models that just include credit ratings by about 14 percentage points. Additionally, depending on the specification of this preliminary analysis, the control variables are statistically

significant and economically meaningful. We therefore use several subsequently explained control variables in our analyses.<sup>3</sup>

On tranche level, we extract information on risk premium, credit rating, credit enhancements, liquidity, and maturity. The risk premium is measured as the credit spread at deal origination, first, because it is difficult to obtain reliable secondary market spreads, second, because the issuance spread is of utmost importance from the originators' perspective. The credit rating is obtained from S&P, Moody's, Fitch, and DBRS ratings. These ratings are converted to a point scale where an increase of 1 point reflects a rating which is one notch worse. From the rating AAA onwards, which corresponds to 1, each decrease in rating notches matches to a one-point increase in our scale – meaning AA+ is 2, AA is 3 and C is 21. In most cases, there is more than one rating so that the average rating is computed from the point scales. As a measure for the credit enhancement, we use the subordination level of each tranche. Consistent to Fabozzi and Vink (2012), this level is computed as the percentage of total liabilities that is subordinate to the tranche. Our proxy variable for the liquidity are the tranche's and the deal's logarithmic nominal value in Euro. Maturity is measured as the weighted average life (WAL) of the tranche.

On deal level, we use information about deal complexity, the segment, sovereign rating, and type of retention. We use the number of tranches as a proxy variable for the deal complexity. The segmentation variable has two possible values, indicating ABS or MBS deals. The sovereign rating is the rating of the country of collateral at the time of origination, i.e. the country where the main part of the underlying collateral is located, and not the country of origination. This is due to the fact that the quality of the security is mainly reflected by characteristics of the underlying assets and not of the originator. The scale of sovereign rating coincides with the credit ratings scale: the higher the value, the worse the sovereign rating.

### 4.3 Descriptive statistics

Summary statistics of our sample are presented in Tables 1, 2, and 3. To provide some insights into the composition of the data, we show the distribution across years, credit ratings, asset classes, and country of collateral in Table 1. We find that AAA tranches are the predominant rating category. Further findings are that MBS represent 78% of the observations. Moreover, the most active securitization markets in Europe (concerning the underlying collateral) are the United Kingdom and the Netherlands with a joint share of more than 60% of the total number of observations.

In Table 2, we present details about the distribution of several credit factors: credit spread, subordination level, weighted average life (WAL), volume, and number of tranches. There is a wide range of credit spreads from -100 bp to 1,150 bp, with typical values around 160 bp. The distribution of the volume of tranches is

<sup>3</sup> Another central aspect of Begley/Purnanandam (2017) is to examine the impact of no-documentation loans (opaque deals) on spreads and performance. No-documentation loans are another source of information asymmetry between investors and originators. These loans do not occur in our data set because in our sample period these are not permitted in the EU.

**Table 1** Summary statistics: composition of the data set

	Obs	Percentage
<i>Panel A: year</i>		
2009	312	9.60
2010	213	6.55
2011	368	11.32
2012	279	8.58
2013	224	6.89
2014	241	7.41
2015	333	10.24
2016	299	9.20
2017	212	6.52
2018	315	9.69
2019	455	14.00
<i>Panel B: credit rating</i>		
AAA	1292	39.74
AA	505	15.53
A	493	15.16
BBB	332	10.21
BB	195	6.00
B	139	4.28
CCC	44	1.35
CC	10	0.31
C	7	0.22
NR	234	7.20
<i>Panel C: asset class</i>		
ABS	689	21.19
CMBS	292	8.98
RMBS	2270	69.82
<i>Panel D: country of collateral</i>		
Austria	9	0.28
Belgium	62	1.91
Finland	27	0.83
France	118	3.63
Germany	261	8.03
Greece	7	0.22
Ireland	133	4.09
Italy	301	9.26
Norway	26	0.80
Poland	2	0.06
Portugal	33	1.02
Spain	268	8.24
Sweden	16	0.49
The Netherlands	648	19.93
United Kingdom	1340	41.22

**Table 1** (continued)

The sample comprises 3251 European floating rate tranches issued between 2009 and 2019. Panel A and B describe the distribution of tranches across years and ratings. Panel C and D report summary statistics of asset classes and country of collateral

**Table 2** Summary statistics: Credit factors

	Obs	Mean	Std. Dev	Min	q25	q50	q75	Max
Credit spread (bp)	3251	164.7	137	−100	70.0	130	210	1150
Subordination level (%)	3251	14.1	12.5	0	5.4	11.2	19	99
WAL (years)	3251	4.6	3.3	0	2.9	4.3	5	30
Vol. tranche (€ millions)	3251	406.5	1146.3	1	23	119	453.9	47,000
Vol. deal (€ millions)	3251	1778.3	3508.4	29	401.4	750	1516.5	50,500
No. tranches	3251	5.4	2.7	1	3	5	7	18

This table reports summary statistics of 3251 floating rate tranches from 1016 ABS and MBS deals issued between 2009 and 2019. The table shows descriptive statistics of credit spreads (dependent variable) and credit factors (independent variables). Subordination level is the percentage of total liabilities that is subordinate to the tranche. WAL is the exposure weighted maturity of the loans. Tranche volume and deal volume are the nominal values in € millions. The credit spreads, subordination level, tranche volume, and WAL are reported on tranche level, and the number of tranches as well as the deal volume are reported on deal level

highly right skewed with a median of € 119 million, a mean of € 406 million, and a maximum of € 47,000 million. Furthermore, a typical deal has between 3 and 7 tranches and a volume of € 1778 million; however, there are some very simple deals with only one tranche and highly complex deals with up to 18 tranches.

Finally, we present summary statistics regarding the type of retention in Table 3. We find that the different regulatory types equity retention, vertical slice retention, sellers share, and random selection are actively used in securitizations. However, most originators choose equity retention. As expected, most observations without qualified retention are issued in 2009 and 2010, meaning that originators chose for 84% of these tranches not to retain a material net economic interest.

In Table 4, we provide the correlation matrix of the rating variables and the credit factor variables. The correlation between rating and credit spreads implies that spreads are mostly determined by the credit rating of a tranche, but some of the control variables are highly correlated with the credit spreads, too.

## 5 Minimum retention requirements and spreads

### 5.1 Quantifying the effect of retention on spreads

As postulated in hypothesis H1, we expect that credit spreads of tranches without qualified retention are significantly higher than for tranches where the originator chooses to retain a material fraction of the deal. To test this hypothesis, we use the specification in Eq. 1:

**Table 3** Summary statistics: Distribution of retention types

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
No qualified retention	298	142	13	22	19	10	21	1	0	0	0	526
Vertical slice	2	0	45	18	23	37	50	41	34	144	217	618
Sellers share	0	52	73	51	14	22	24	10	0	5	14	265
Random selection	0	0	18	8	20	28	45	30	9	15	40	213
Equity retention	12	19	219	180	148	144	193	217	169	151	177	1629

This table describes the usage of different types of retention. The category “no qualified retention” refers to observations where retention is less than 5% or retention is not reported in the investment prospectus

**Table 4** Correlation matrix

	Spread	Rating	Subordina- tion level	WAL	Vol. tranche	Vol. deal	No. tranches
Spread	1						
Rating	0.50	1					
Subordination level	-0.27	-0.42	1				
WAL	0.02	0.22	-0.15	1			
Vol. tranche	-0.50	-0.49	0.25	-0.07	1		
Vol. deal	-0.12	-0.08	-0.11	0.09	0.57	1	
No. tranches	0.27	0.10	0.02	-0.03	-0.22	0.26	1

This table presents the pairwise correlations of credit spreads, the credit factor variables and our control variable rating

$$\text{spread}_i = \beta_0 + \beta \cdot \text{retention}_i + \delta' \cdot \text{credit factors}_i + \chi' \text{controls}_i + \psi_t + \psi_s + \varepsilon_i, \quad (1)$$

where  $i$  indicates a specific tranche. We describe the credit factors and control variables in Sect. 4 (see also Table 1 and Table 2). Regarding control variables, in all specifications, we include tranches' ratings and the sovereign rating of the country in which most of the collateral is located. Furthermore, to account for unobserved macroeconomic conditions and unobserved segment specific factors, we implement year fixed effects  $\psi_t$  and segment fixed effects  $\psi_s$ . Standard errors are clustered on deal level. We run this regression in six specifications. Models with even numbers contain both segments ABS and MBS, whereas in models with odd numbers we restrict the segment to the large and homogenous subsample of MBS. We present the results in Table 5. In our models, "no qualified retention" is the base category, so that the reported coefficients of retention present the spread difference in comparison to this category.

We begin by presenting the results for the complete sample, encompassing both ABS and MBS tranches. Models (1) and (2) demonstrate that credit spreads decrease by approximately 26 to 39 bps if the originator retains a material fraction of at least 5% of the deal's nominal value – a finding that is both economically substantial and statistically robust. This result aligns with our hypothesis H1 and is particularly relevant for the subsample of MBS (model (2)), which comprises 78% of the total observations. The use of this reduced sample offers the advantage of potentially more homogeneous risk assessments by investors across these observations.

Consistent with theoretical predictions, retention is expected to be particularly significant for information-sensitive tranches. Thus, we split our sample into information-sensitive tranches (models (3) and (4)) and insensitive tranches (models (5) and (6)). For information-sensitive tranches, both, statistical significance and economical meaning increase substantially. Especially for non-AAA MBS tranches, we identify a material spread reduction of 123 bp if the originator retains a material fraction of the deal. Given the average nominal amount of each

**Table 5** Quantifying the effect of retention on spreads

	All ABS&MBS (1)	All MBS (2)	No AAA ABS&MBS (3)	No AAA MBS (4)	Only AAA ABS&MBS (5)	Only AAA MBS (6)
	Credit spread	Credit spread	Credit spread	Credit spread	Credit spread	Credit spread
Retention	-26.612* (-1.688)	-39.134* (-1.962)	-106.930*** (-3.204)	-123.181*** (-3.529)	8.533 (1.358)	8.093 (1.033)
Subordination level	-0.464* (-1.895)	-0.729*** (-2.647)	-1.388*** (-4.173)	-1.922*** (-4.939)	0.993*** (3.485)	0.905*** (2.861)
WAL	-3.140* (-1.929)	-2.948 (-1.595)	-4.916*** (-3.225)	-5.166*** (-2.921)	3.845 (1.212)	4.481 (1.274)
Log(Vol. tranche)	-27.076*** (-9.279)	-28.922*** (-8.353)	-30.989*** (-6.317)	-33.264*** (-5.549)	-0.005 (-0.003)	-0.223 (-0.116)
Log(Vol. deal)	6.473 (1.213)	10.739* (1.786)	4.870 (0.568)	12.682 (1.318)	-5.864*** (-2.675)	-5.732* (-2.451)
No. tranches	6.638** (2.511)	4.876 (1.578)	7.511** (2.439)	3.927 (1.047)	4.770*** (2.958)	4.448** (2.558)
Constant	458.325*** (5.553)	421.647*** (4.744)	576.644*** (4.777)	489.161*** (3.946)	143.214*** (3.484)	146.445*** (3.405)
Observations	3251	2562	1959	1574	1292	988
R <sup>2</sup>	0.393	0.384	0.301	0.311	0.442	0.444
Adjusted R <sup>2</sup>	0.389	0.379	0.294	0.303	0.434	0.434
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Segment FE	Yes	-	Yes	-	Yes	-
Controls:						
Sovereign rating	Yes	Yes	Yes	Yes	Yes	Yes
Rating	Yes	Yes	Yes	Yes	-	-
Clustered SE	Deal	Deal	Deal	Deal	Deal	Deal

The table reports results of OLS regressions of credit spreads (in bps) on the indicator variable retention (see Eq. 1). The coefficient of retention represents the additional risk premium in comparison to "no qualified retention". Models (1) and (2) include all tranches, (3) and (4) restrict the sample to information-sensitive tranches (no AAA), and models (5) and (6) restrict the sample to information-insensitive tranches (only AAA). Models with even numbers contain both segments ABS and MBS, whereas models with odd numbers restrict the segment to MBS. Standard errors are clustered on deal level. The *t*-statistics are in parentheses. The symbols \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively



non-AAA MBS tranche of € 427 million, this translates to an approximate premium of € 5.26 million attributable to asymmetric information for each tranche. These findings strongly support our hypothesis H1 and are fully consistent with theoretical arguments. The value of information-sensitive tranches is very sensitive to the quality of the underlying assets. If screening and monitoring incentives are low, which is the case if the originator does not retain a material fraction of the deal, investors anticipate these diverging interests. As a consequence, they only invest if they are compensated for the risk of facing adverse selection and moral hazard problems in terms of a substantial additional risk premium.

Analyzing the subsample of AAA tranches (models (5) and (6)), we exclude the variable credit rating as an explanatory variable because all these tranches have the same rating. For these (almost) information-insensitive tranches, the results are substantially different from the full sample and from information-sensitive tranches: The coefficients of retention become statistically insignificant and economically meaningless. To sum up, we find a significant impact of retention on credit spreads, which is economically substantial for information-sensitive (non-AAA) tranches but not for information-insensitive (AAA) tranches, which is in line with hypotheses H1 and H2.

After the analyses of the effect of retention on spreads based on an IV approach in Sect. 5.2, we investigate the effect of different types of retention, namely equity and vertical slice retention in Sect. 6.

## 5.2 Instrumental variable approach: The access to no-retention-deals

Previously, we quantified the spread reduction effect of retention due to asymmetric information and incentive problems—overall and depending on the position of the tranche in the subordination mechanism.

A potential concern regarding the causal effect of retention on spreads might be a selection bias: Although the pools of deals with and without retention do not seem to differ systematically in observables (Ashcraft et al., 2019; Hibbeln & Osterkamp, 2024b), originators could assign systematically less risky (in terms of unobservable information) loans to deals with retention. By contrast, they assign bad quality loans to deals without retention where they do not have skin in the game. Additionally, originators could also anticipate their future reduced monitoring effort. Summing up, our OLS results might be biased to the selection of distinct loans into the deals. Therefore, we subsequently implement an IV approach.

To show that retention influences the spreads of the tranches, we construct an instrument according to Ashcraft et al. (2019). In contrast to our study, Ashcraft et al. (2019) rather focus on the analysis of the tranche performance of US CMBS deals. Regarding spreads however, they only consider the tranches which are directly superior to the first loss piece in the subordination mechanism. Although they find a significant increase in tranche performance in the presence of retention, they do not find that this is reflected in the spreads. This might be due to the fact that they investigate a pre-crisis sample and investors did not care so much about the harmonization of interests than rather relied on the pool diversification

and ratings of securitizations. Investors therefore might have not demanded an additional risk premium for securitizations without retention. On the contrary, we build our analyses on a post-subprime crisis sample. After that, however, investors are likely aware of incentive problems in securitizations which have been demonstrated by the literature (e. g. Titman & Tsyplakov, 2010; Keys et al., 2010). Because of this awareness it is reasonable to expect differing results in the post-crisis period, which we analyze.

The instrument according to Ashcraft et al. (2019) is “the moving average of the percentage of no-retention-deals by the same originator including all deals other than  $d$ , issued within in a window surrounding one year before and one year after the issuance of deal  $d$ ” (Hibbeln & Osterkamp, 2024b). This instrument measures the originators’ options to assign bad quality loans to a deal without retention to avoid losses (“access” to non-retention deals). Regarding the validity of the instrument, the F-statistics of the first stage (see Table 6) confirm that the instrument is relevant. To violate the exclusion restriction, there would need to be a time-variant variable in the error term, which is correlated with the instrument. While the introduction of minimum retention requirements correlates with the share of deals without retention, this regulation is unlikely to influence spreads via another variable. We also include originator fixed effects to assure that the exclusion restriction is fulfilled. Potential concerns regarding the instrument are discussed extensively in Appendix D of Hibbeln and Osterkamp (2024b).

As described in H3, we expect the spread of a tranche  $i$  to be lower if the originator  $o$  has more options to assign loans to deals without retention, meaning that the share of deals without retention is high around the time of issuance of tranche  $i$ . Equation 2 presents the second stage of the two stage least square (2SLS) IV approach. The setting is based on the regression of Eq. 1; however, we replace the variable of interest *retention* with the fitted values of *retention*, resulting from first stage of the 2SLS estimation. Since the instrument is time-variant, we can still employ time fixed effects without absorbing the variation of retention.

$$\text{spread}_i = \beta_0 + \beta \cdot \text{fitted retention}_i + \delta' \cdot \text{credit factors}_i + \chi' \text{controls}_i + \psi_o + \psi_t + \psi_s + \varepsilon_i \quad (2)$$

The results are presented in Table 6. These findings reinforce the prior OLS findings in terms of both sign and significance, underscoring the robustness of the earlier conclusions concerning the effect of retention on spreads. The size of the effect, however, is even more pronounced. Theoretical considerations, coupled with the IV approach, strongly indicate a causal relationship between retention and spreads. For the information-sensitive MBS subsample, the IV approach suggests an economically meaningful and statistically highly significant spread reduction of 384 basis points. Summing up, the findings robustly confirm or hypothesis H3. It is worth mentioning that these results contrast with the findings of Ashcraft et al. (2019) for the US pre-crisis period. This discrepancy suggests that European securitization investors are acutely aware of incentive problems following the subprime crisis. A comparison between the OLS and IV results indicates that the OLS analysis may underestimate the effect of retention on spreads.

**Table 6** Instrumental variable approach

	All ABS&MBS (1)	All MBS (2)	No AAA ABS&MBS (3)	No AAA MBS (4)	Only AAA ABS&MBS (5)	Only AAA MBS (6)
	Credit spread	Credit spread	Credit spread	Credit spread	Credit spread	Credit spread
Fitted retention	-72.060 (-1.360)	-152.123 <sup>**</sup> (-2.115)	-270.952 <sup>***</sup> (-2.885)	-384.781 <sup>***</sup> (-4.061)	-8.916 (-0.380)	-16.131 (-0.363)
Subordination level	-1.439 <sup>***</sup> (-4.486)	-1.736 <sup>***</sup> (-4.306)	-1.884 <sup>***</sup> (-4.296)	-2.455 <sup>***</sup> (-4.806)	0.532 (1.145)	0.252 (0.438)
WAL	-3.426 <sup>**</sup> (-2.378)	-3.135 <sup>*</sup> (-1.928)	-6.117 <sup>***</sup> (-4.066)	-6.698 <sup>***</sup> (-3.459)	6.108 <sup>*</sup> (1.833)	7.011 <sup>**</sup> (1.983)
Log(Vol. tranche)	-23.397 <sup>***</sup> (-9.014)	-24.664 <sup>***</sup> (-7.904)	-28.355 <sup>***</sup> (-6.041)	-28.698 <sup>***</sup> (-4.886)	-1.476 (-0.837)	-1.509 (-0.790)
Log(Vol. deal)	12.497 <sup>**</sup> (2.273)	15.190 <sup>***</sup> (2.687)	9.851 (1.297)	11.259 (1.238)	-6.125 <sup>*</sup> (-1.784)	-5.757 (-1.557)
No. tranches	8.196 <sup>***</sup> (2.998)	8.192 <sup>**</sup> (2.406)	11.673 <sup>***</sup> (4.053)	12.268 <sup>***</sup> (3.465)	5.698 <sup>**</sup> (2.308)	5.978 <sup>**</sup> (1.985)
Constant	309.747 <sup>***</sup> (3.710)	275.909 <sup>***</sup> (3.105)	442.341 <sup>***</sup> (3.906)	400.856 <sup>***</sup> (3.150)	190.235 <sup>***</sup> (3.003)	194.392 <sup>***</sup> (2.869)
Observations	3241	2558	1951	1572	1290	986
R <sup>2</sup>	0.572	0.542	0.595	0.582	0.615	0.614
Adjusted R <sup>2</sup>	0.534	0.499	0.543	0.526	0.535	0.526
First stage F-test	45.43	27.14	14.05	19.14	35.29	12.56
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Originator FE	Yes	Yes	Yes	Yes	Yes	Yes
Segment FE	Yes	-	Yes	-	Yes	-
Controls:						
Sovereign rating	Yes	Yes	Yes	Yes	Yes	Yes
Rating	Yes	Yes	Yes	Yes	-	-
Clustered SE	Deal	Deal	Deal	Deal	Deal	Deal

The table reports the second stage of the 2SLS IV regression (Eq. 2), analyzing the impact of retention on credit spreads (in bps). The coefficient of fitted retention represents the additional risk premium in comparison to "no qualified retention". Models (1) and (2) include all tranches, (3) and (4) restrict the sample to information-sensitive tranches, and models (5) and (6) restrict the sample to information-insensitive tranches. Models with even numbers contain both segments ABS and MBS, whereas models with odd numbers restrict the segment to MBS. Standard errors are clustered on deal level. The *t*-statistics are in parentheses. The symbols \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively

## 6 Comparison of equity and vertical slice retention

Subsequently, we compare the different effects of equity retention and vertical slice retention depending on information-sensitive and information-insensitive tranches. To compare vertical slice and equity retention, we restrict our data set to those deals which have any of these two retention types. Hence, deals with no qualified retention, seller's share, and random selection are excluded from the following analyses.

As postulated in hypothesis H4, we expect for information-sensitive tranches that credit spreads are lower if the deal is equipped with equity retention instead of vertical slice retention. However, according to hypothesis H5a/H5b it is unclear whether investors of information-insensitive tranches prefer equity retention (because of higher screening incentives) or vertical slice retention (because of higher monitoring incentives). Considering information-insensitive AAA investors, there might be two opposing effects of screening and monitoring incentives. On the one hand, one can argue that information-insensitive investors (in line with information-sensitive investors) demand high screening incentives for the originator. Because theory suggests that equity retention maximizes these screening incentives, they prefer deals with a retained equity tranche. In conclusion, if this effect dominates, credit spreads of AAA tranches are expected to be lower for deals with equity retention. On the other hand, theory suggests that vertical slice retention could be beneficial for investors of information-insensitive tranches due to higher monitoring incentives because even after severe losses to the asset pool and a complete default of the equity tranche, the originator maintains skin in the game. In such a situation, retention of the equity tranche does not induce incentives to monitor the remaining non-defaulted assets. On the contrary, retention of a vertical slice maintains the desired incentives for originators even in downturn scenarios. In other words, as the positions of originators and investors are more similar in case of vertical slice retention, their interests to reduce losses on an ongoing basis are more aligned. From a theoretical perspective, it remains unclear which of these two effects dominates. Consistent with the previous analyses, at first we analyze the entire sample (models (1) and (2)); to test hypotheses H4, we then only consider non-AAA tranches (models (3) and (4)); at last, analyzing H5a/b, we only take the information-insensitive AAA tranches into consideration (models (5) and (6)). According to Sect. 5.1, we use the following model specification

$$\text{spread}_i = \beta_0 + \beta \cdot \text{vertical slice}_i + \delta' \cdot \text{credit factors}_i + \chi' \text{controls}_i + \psi_t + \psi_s + \varepsilon_i, \quad (3)$$

where *Vertical Slice<sub>i</sub>* is an indicator variable that takes the value one if the originator chooses vertical slice retention instead of equity retention. The credit factors and control variables are described in Sect. 4 (see also Table 1 and Table 2). The findings, as detailed in Table 7, reveal that across the full sample, credit spreads are 32 bp higher for vertical slice retention compared to equity retention. This effect is even more pronounced in information-sensitive tranches, where the difference widens by an additional 7 bp, totaling a 39 bp increase. These coefficients are both statistically robust and economically meaningful, underscoring the substantial impact of retention structure on credit spreads. The results specific to MBS deals closely

**Table 7** Comparing vertical slice and equity retention

	All ABS&MBS (1)	All MBS (2)	No AAA ABS&MBS (3)	No AAA MBS (4)	Only AAA ABS&MBS (5)	Only AAA MBS (6)
	Credit spread	Credit spread	Credit spread	Credit spread	Credit spread	Credit spread
Vertical slice	32.386*** (3.564)	29.804*** (3.155)	39.569*** (3.414)	37.264*** (3.101)	-3.145 (-0.573)	-2.003 (-0.336)
Subordination Level	-0.294 (-1.241)	-0.421 (-1.591)	-1.191*** (-3.389)	-1.693*** (-3.711)	0.880** (2.087)	0.831* (1.822)
WAL	-2.002 (-0.747)	-1.512 (-0.491)	-3.467 (-1.560)	-3.350 (-1.271)	7.482 (1.308)	8.724 (1.427)
Log(Vol. tranche)	-27.686*** (-7.955)	-27.637*** (-6.986)	-28.779*** (-4.935)	-26.297*** (-3.514)	2.137 (0.725)	0.939 (0.286)
Log(Vol. deal)	2.361 (0.406)	4.073 (0.643)	-0.722 (-0.082)	-0.029 (-0.003)	-12.930*** (-4.453)	-11.425*** (-3.728)
No. tranches	4.104 (1.104)	3.165 (0.777)	2.393 (0.579)	0.475 (0.099)	6.219*** (3.379)	6.027*** (3.404)
Constant	539.218*** (5.271)	405.821*** (3.978)	561.215*** (4.108)	354.910*** (2.741)	264.850*** (3.449)	263.526*** (3.372)
Observations	2247	1826	1469	1216	778	610
R <sup>2</sup>	0.421	0.416	0.333	0.338	0.490	0.496
Adjusted R <sup>2</sup>	0.416	0.410	0.324	0.328	0.478	0.482
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Segment FE	Yes	-	Yes	-	Yes	-
Controls:						
Sovereign Rating	Yes	Yes	Yes	Yes	Yes	Yes
Rating	Yes	Yes	Yes	Yes	-	-
Clustered SE	Deal	Deal	Deal	Deal	Deal	Deal

The table reports results of OLS regressions relating the indicator variable vertical slice and credit spreads (in bps) (Eq. 3). The coefficient of vertical slice represents the additional risk premium in comparison to equity retention. In these analyses, we exclude all deals with other retention types or no qualified retention. Models (1) and (2) include all tranches, (3) and (4) restrict the sample to information-sensitive tranches, and models (5) and (6) restrict the sample to information-insensitive tranches. Models with even numbers contain both segments ABS and MBS, whereas models with odd numbers restrict the segment to MBS. Standard errors are clustered on deal level. The *t*-statistics are in parentheses. The symbols \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, and 1% level, respectively

mirror the combined findings observed across ABS/MBS tranches, reinforcing the generalizability of our conclusions. The evidence corroborates that investors in non-AAA tranches require an additional risk premium when originators opt for vertical slice retention over equity retention, thereby validating our hypothesis H4.

For insensitive tranches, we find coefficients which are close to zero and statistically insignificant (models (5) and (6)). As a result, we have to reject both, H5a & H5b. This suggests that AAA investors appear indifferent to the retention type employed in a deal. A possible explanation for this finding is that the effects of screening and monitoring mechanisms may cancel out each other, making the retention type irrelevant for AAA investors.

## 7 Conclusion

This study robustly demonstrates how investors systematically incorporate asymmetric information into the pricing of securitizations. Consistent with theoretical models, our findings reveal that investors impose a substantial risk premium when originators retain no material share of securitizations. This result is particularly pronounced among investors of non-AAA tranches, where the asymmetric information is the most impactful. Furthermore, credit spreads of these tranches are significantly elevated when the originators choose vertical slice retention over equity retention, reflecting the superior screening and monitoring incentives associated with equity retention. The impact on non-AAA MBS tranches is both statistically significant and economically meaningful, manifesting as a 123 basis point risk premium due to asymmetric information—translating to an estimated € 5.26 million for the average non-AAA MBS tranche.

Beyond our OLS findings, we validate these effects using an instrumental variable (IV) approach leveraging access to no-retention-deals as the instrument. This methodological approach offers a reliable validation of the observed effects. The integration of theoretical rationale with empirical analysis strongly suggests that retention has a causal impact on credit spreads, with the IV results hinting at a potential underestimation in the OLS findings.

Overall, this research enhances the comprehension of how investors perceive and assess asymmetric information in securitizations. Our results underline that the extent of asymmetric information is an important component for the pricing of securitizations. These results have important implications for originators and the broader regulatory framework governing securitization. Firstly, originators must acknowledge that elevated levels of asymmetric information necessitate a substantial risk premium from investors. Consequently, originators should strategically structure deals to enhance and ensure rigorous screening and monitoring incentives. Secondly, regulatory frameworks should recognize that investors already factor asymmetric information heavily into their securitization pricing models. Our results suggest that rules regarding the disclosure of information, specifically regarding retention type and magnitude, could mitigate the costs of asymmetric information. To enhance transparency, regulators could make this critical information available in a publicly accessible database, rather than confining it to investment prospectuses alone.

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