

# RETAIL INVESTORS AS STUMBLING BLOCKS IN BOND RESTRUCTURING: EVIDENCE FROM BONDHOLDER MEETINGS

Valentin Peter<sup>\*</sup>, Britta Hachenberg<sup>\*\*</sup>, Dirk Schiereck<sup>\*\*\*</sup>

<sup>\*</sup> Chair of Corporate Finance, Technical University of Darmstadt, Darmstadt, Germany

<sup>\*\*</sup> Cologne University of Applied Sciences, Cologne, Germany

<sup>\*\*\*</sup> *Corresponding author*, Chair of Corporate Finance, Technical University of Darmstadt, Darmstadt, Germany  
Contact details: Chair of Corporate Finance, Technical University of Darmstadt, Hochschulstr. 1, 64289 Darmstadt, Germany



## Abstract

**How to cite this paper:** Peter, V., Hachenberg, B., & Schiereck, D. (2021). Retail investors as stumbling blocks in bond restructuring: Evidence from bondholder meetings. *Corporate Ownership & Control*, 19(1), 169–187.  
<https://doi.org/10.22495/cocv19i1art13>

Copyright © 2021 The Authors

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0).  
<https://creativecommons.org/licenses/by/4.0/>

**ISSN Online:** 1810-3057

**ISSN Print:** 1727-9232

**Received:** 09.07.2021

**Accepted:** 08.11.2021

**JEL Classification:** G34, G32

**DOI:** 10.22495/cocv19i1art13

Using a detailed database of meeting agendas, participation rates, and voting outcomes of bondholder meetings collected from [bundesanzeiger.de](http://bundesanzeiger.de), the official press releases of issuers, and the documents provided by Schutzgemeinschaft der Kapitalanleger as well as Deutsche Investoren Union, we analyze the determinants for successful bond restructurings under the German Bond Act. The law regulates bond restructuring in Germany and contains collective action clauses that intend to make the amendment of bond terms easy compared to the U.S. where these clauses are not common. We find that bond restructuring is relatively convenient under the German Bond Act, as the majority of restructuring attempts are successful. Applying ordinary least squares regression as well as a probit regression model, we explicitly focus on how bond holdings of retail investors impact bond restructuring and find that participation rates, the probability to constitute quorums in bondholder meetings, and most importantly, the probability to successfully amend bond terms, are negatively related to the degree of bond holdings of retail investors. Given that German corporate bond markets just recently opened up for retail investors through the introduction of mini-bond segments, bond issuers need to be aware that targeting retail investors reduces the ability to amend bond terms, which can be particularly relevant in times when issuers are faced with financial difficulties.

**Keywords:** Bond Restructuring, Retail Investors, Rational Apathy

**Authors' individual contribution:** Conceptualization — V.P.; Methodology — V.P.; Formal Analysis — V.P.; Data Curation — V.P.; Writing — Original Draft — V.P.; Writing — Review & Editing — B.H. and D.S.; Supervision — B.H. and D.S.; Project Administration — B.H. and D.S.

**Declaration of conflicting interests:** The Authors declare that there is no conflict of interest.

## 1. INTRODUCTION

During periods of financial distress of corporate debtors, bondholders face disadvantages vis-à-vis large creditors, due to the dispersed nature of bond debt and coordination and representation difficulties of bondholders (Gertner & Scharfstein, 1991; Berglöf & van Thadden, 1994; Bolton & Scharfstein, 1996; Bolton & Freixas, 2000).

These difficulties result in collective action and collective representation problems of bondholders (Schmidtbleicher, 2010, p. 41). Compared to the Trust Indenture Act of 1939 in the U.S., the German Bond Act offers issuer-friendly rules for bond restructuring (Lürken & Pickerill, 2011, p. 355) and enables bondholders to amend bond terms through majority votes in two successive bondholder meetings. The German law also

addresses the major problems bondholders face during the restructuring process. On the one hand, collective action problems are addressed through the low quorum requirements of bondholder meetings, collectively binding bondholder votes on bond term amendments, the permission of proxy votes, and the introduction of votes without meetings. On the other hand, collective representation problems are addressed through the appointment of a joint representative, who can be either elected through bondholder vote or designated in the bond terms (Schulenburg, 2017, p. 71). Beginning in 2010, the German exchanges created bond market segments<sup>1</sup> that explicitly targeted retail investors, for example, by allowing minimum denominations of only EUR 1,000 per bond (Achleitner & Volk, 2013, p. 159). Retail investors are especially prone to coordination problems, as they are less sophisticated and act irrationally (e.g., Grinblatt & Han, 2005) and usually hold minuscule security investments<sup>2</sup>, which make it even less attractive for them to get informed about the situation of a bond issuer and participate in bond restructuring attempts (Becker & Josephson, 2016, p. 2819).

The current body of empirical research provides ample evidence on bond restructuring with a focus on data from the U.S. (Gilson, John, & Lang, 1990; Asquith, Gertner, & Scharfstein, 1994; Franks & Torous, 1994) and the behavior of institutional investors, such as hedge funds (Wang, 2011). In contrast, bond restructuring events with a focus on Germany and the impact of retail investors have not been studied intensively. To our knowledge, a detailed economic analysis of the German Bond Act and bondholder meetings in Germany has not been conducted so far.

We address these research gaps by analyzing the determinants for successful bond restructuring attempts in Germany. Our research is based on a hand-collected database of 139 bondholder meetings of 47 bond issuers. This dataset is combined with bond holding data of retail investors, obtained from the Securities Holdings Statistics (SHS) of Deutsche Bundesbank<sup>3</sup>. First, we analyze the success of different bondholder meetings and bond restructuring events, respectively. As quorum requirements are relatively moderate and issuers' autonomy to amend bond terms in bondholder meetings is high, we expect bond term amendments to be easily feasible and such restructuring attempts to be predominantly successful. Second, we focus on the bond holdings of retail investors. Due to severe coordination problems of investors, we expect them to complicate the aspired bond term amendments and to be "stumbling blocks" in the restructuring process. Therefore, our research questions are as follows:

*RQ1: How effective is the German Bond Act when issuers attempt to amend bond terms or to restructure bonds respectively?*

*RQ2: How do retail investors' bond holdings impact the participation rates of bondholder meetings, the likelihood of reaching quorums in bondholder meetings, and the likelihood of successfully conducting bond restructurings?*

Our findings can be summarized as follows. First, most attempts to amend bond terms are unsuccessful in the first meeting, but finally, gain approval during the second meeting. Bond restructuring attempts are generally successful when considering both first and second bondholder meetings together. Second, a higher proportion of bond holdings of retail investors significantly lower the participation rates in bondholder meetings. The higher the percentage of retail investors, the less likely bondholder meetings constitute quorums. Most importantly for a bond issuer, a higher percentage of bond holdings of retail investor holdings lowers the probability of conducting successful bond restructuring attempts.

This analysis complements literature on the German bond market, debt restructuring, and the behavior of retail investors in several ways. It adds to the ongoing discussion regarding the recent developments and flaws in the German bond market, especially following the introduction of mini-bond segments. We add to this stream of literature by presenting evidence that the German Bond Act provides an issuer-friendly framework to amend bond terms; however, bond holdings of retail investors make these amendments more difficult. In addition, we shed light on the under-researched area of bond restructuring in Germany, where the focus of research is primarily the restructuring of bank debt (Brunner & Krahn, 2008; Jostarndt & Sautner, 2010). Finally, we complement existing research on the behavior of retail investors toward the bond market, which has been focused predominantly on the stock market (Nili & Kastiel, 2016).

The remainder of this paper is structured as follows. Section 2 provides a review of central papers of bond restructuring in the U.S., behavior of retail investors, the German bond market, and debt restructuring in Germany, and explains how our paper extends these literature streams. This section also elaborates on the legal environment of bond restructuring under the German Bond Act. Based on the literature review we develop our research hypotheses in Section 3. Section 4 introduces the dataset and variable definitions, while our empirical strategy and results are presented in Section 5. We provide robustness tests for our findings in Section 6 and conclude the paper in Section 7.

## 2. LITERATURE REVIEW

### 2.1. Bond restructuring

This paper relates to several streams of research, which are introduced as follows. First, it complements the existing research on bond restructuring. This stream has focused primarily on the U.S., with theoretical papers by Roe (1987) and Coffee and Klein (1991), who emphasize how the Trust Indenture Act of 1939 creates holdout problems for bond restructuring, and how bond issuers can circumvent these issues. The lack of collectively binding majority votes of bondholders, according to Sec. 316(b) of the Trust Indenture Act causes these problems and may contribute to unnecessary bankruptcies, when troubled bond issuers fail to convince bondholders to participate in the bond

<sup>1</sup> Bondm (Stuttgart), Entry Standard (Frankfurt), Mittelstandsmarkt (Düsseldorf), m:access (Munich), and Mittelstandsbörse Deutschland (Hamburg-Hannover).

<sup>2</sup> According to Deutsche Bundesbank (2019), the mean and median portfolios of German households have a volume of EUR 43,700 and EUR 9,900, respectively.

<sup>3</sup> The data is based on Bade, Flory, Gomolka, and Schönberg (2019).

restructuring (Roe, 1987, pp. 236-237). Coffee and Klein (1991) show how issuers can use coercion techniques to pressure bondholders to participate in bond restructurings. As collectively binding majority votes are missing, bond issuers use exchange or tender offers to alter the capital structure or debt terms. By either overstating the risk of insolvency, which creates a higher cost for debtors than an out-of-court restructuring (Jensen, 1989; Gilson et al., 1990; Asquith et al., 1994), or by offering bonds with higher seniority in exchange for old bonds, which makes the remaining bonds less valuable, issuers convince bondholder to participate in the restructuring and circumvent the disadvantages of the regulations of the Trust Indenture Act (Coffee & Klein, 1991, pp. 1211-1212). Chatterjee, Dhillon, and Ramirez (1995) examine the relationship between holdout problems and coercive techniques and find that financially less distressed issuers experience severe holdout problems and must use stronger coercion to convince bondholders to participate. Gilson et al. (1990, p. 338) find that a successful out-of-court restructuring of troubled debtors is more likely when the financing structure of issuers is less complex, for example, when the share of bank debt is higher and the total number of debt contracts is lower. The authors conclude that the holdout problem is more severe the higher the number of bondholders and the more heterogeneous claimholders are involved. Asquith et al. (1994, p. 642) examine a sample of restructuring cases and find that when issuers face holdout problems with dispersed bondholders during exchange offers, they rely on coercive techniques, such as the offer of most senior securities. Examining tender offers and premiums on bonds in the U.S., Mann and Powers (2007) find that participation rates in the tender offer are higher when premiums increase. In addition, issuers must offer higher premiums when more restrictive bond covenants are in place. Danis (2016) examines the relationship between bondholder participation rates in distressed exchanges and the existence of credit default swap (CDS). The author finds that the participation rates of bondholders are lower when CDS are traded on the respective bond, which, in turn, exacerbates the holdout problem.

This paper complements this stream of research by examining a dataset of bond issuers who restructured their bonds according to the German Bond Act. As the German regulations differ from the U.S. Trust Indenture Act, namely the German law provides collectively binding majority votes and very low quorum requirements, holdout and holdup problems should be mitigated to a great extent. Therefore, German issuers should find it convenient to amend bond terms and to restructure bonds.

## 2.2. Restructuring of bonds under the German Bond Act

In this subsection, we review the collective action and representation problems of bond restructuring and explain how the German Bond Act attempts to solve these issues. Collective action problems can be subdivided into holdout and holdup problems, and the rational apathy of bondholders (Vogel, 2011, pp. 115-116). Generally, holdout problems in bond restructuring arise in the following setting: A bond

issuer faces financial difficulties and attempts to amend bond terms in order to avoid bankruptcy. Bondholder group A refuses to consent to the proposed bond term amendments, while bondholder group B makes the proposed concessions. Both bondholder groups enjoy the benefits of avoiding bankruptcy of the issuer, but only bondholder group B incurs the costs, while group A exploits group B. It is the dominant strategy of each bondholder group not to consent to the bond term amendments in order to avoid being exploited (for a detailed description of the holdout problem see Roe, 1987, pp. 236-239; Schmidtbleicher, 2010, pp. 43-54). Holdup problems arise when single bondholders are in a stronger position vis-à-vis large bondholders or the issuer, and they (i.e., single bondholders) are in a position to demand separate compensation for participating in the amendment of bond terms, a process that offers these bondholders a blackmail potential (Cagalj, 2013, p. 146). Finally, rational apathy of bondholders occurs when the cost of becoming informed and engaging in the bond restructuring process outweighs its benefits (Schmidtbleicher, 2010, pp. 61-63). Investors who hold small shares of bonds are potentially prone to rational apathy, as they face low economies of scale in becoming informed (Becker & Josephson, 2016, p. 2819). The collective representation problems in bond restructuring arise due to the dispersed and anonymous nature of bondholders, who are not only unknown to the issuer but also to each other, and these problems make negotiations between the issuer and bondholders ineffective (Schmidtbleicher, 2010, p. 63).

The German Bond Act addresses these issues through a variety of measures. Holdout and holdup problems are addressed through collective action clauses or collectively binding effects of majority consent in bondholder meetings (see Sec. 4, German Bond Act). For the material amendment of bond terms, the law sets relatively low requirements for majority consent votes. Issuers can call for a first bondholder meeting, which requires a quorum of 50% of outstanding bond capital<sup>4</sup>, while a second bondholder meeting, which can be called in case the first bondholder meeting fails to reach the required quorum, only needs 25% of bond capital to constitute a quorum (Sec. 15 (3), German Bond Act). Material bond term amendments (according to Sec. 5 (3) No. 1-9, German Bond Act) must obtain approval rates of 75% of the participating bond capital, while other voting items require only 50% approval rates (Sec. 5 (4), German Bond Act). This indicates that during the second bondholder meeting only 18.75% of total bond capital is sufficient to amend the material bond terms (Lürken & Pickerill, 2011, p. 358)<sup>5</sup>. Collectively, the binding effect of majority consent in bondholder meetings (bond term amendments are binding for outvoted or non-voting bondholders (Sec. 5 (2) No. 1, German Bond Act) mitigates the free riding and blackmailing potential of small bondholders vis-à-vis larger bondholder groups or the issuer and reduce

<sup>4</sup> This quorum requirement is high, when compared to the regulations according to the German Corporation Act, Sec. 133 (1), which does not specify a quorum requirement but only states that a simple majority is required to make decisions in shareholder meetings.

<sup>5</sup> Table A.1 (see Appendix) provides an overview of the approval rate and quorum requirements in bondholder meetings according to the German Bond Act of 2009.

collective action problems to a large extent (Schulenburg, 2017, pp. 78-79). The law also provides measures to mitigate the rational apathy of bondholders through the inclusion of proxy votes (Sec. 14, German Bond Act) and allows the vote without meeting (Sec. 18, German Bond Act), which is virtual voting without a personal meeting of the bondholders (Kirchner, 2011, p. 318). These measures are included in order to lower both indirect costs for bondholders to get informed (e.g., through the transfer of voting rights to investor's representative) and direct costs for travel to bondholder meeting destinations (Kirchner, 2011, p. 318). Finally, the problem of collective representation is addressed through the appointment of a joint representative (Sec. 7, German Bond Act), who can be designated and empowered to act on behalf of the bondholders through majority consent (Sec. 5 (1) No. 1, German Bond Act). Both rights and authority of the Joint Representative are entitled by the majority vote of bondholders (Sec. 7 (2) No. 1, German Bond Act).

With the redesign of the German Bond Act in 2009, the available tool kit of restructuring measures was broadened, for example, through the introduction of the haircut (Sec. 5 (3) No. 3, German Bond Act) and the debt-to-equity swap (Sec. 5 (3) No. 3, German Bond Act), and a proactive bond restructuring was authorized, whereas according to Sec. 11 (1) of the German Bond Act of 1899 the looming bankruptcy of the issuer was required in order to conduct a restructuring (Vogel, 2011, p. 112). Nevertheless, the old law of 1899 also includes features to overcome the problems of bond restructuring, such as the low quorum requirements (Sec. 11, German Bond Act 1899). This paper focuses exclusively on bondholder meetings held according to the redesigned law of 2009, as quorum requirements, especially for the second meeting were altered and are not directly comparable between the old and the new law<sup>6</sup>.

Overall, existing research, legal researchers and practitioners, consider the German Bond Act 2009 as a decent and issuer-friendly tool to amend bond terms (Lürken & Pickerill, 2011, p. 357), especially in comparison to the U.S. Trust Indenture Act of 1939. The U.S. law requires a higher quorum, so virtually all bondholders must agree to amended bond terms (Lürken & Pickerill, 2011, p. 355). This means that bond term amendments are hardly possible and bond restructuring is mostly conducted through distressed exchanges, where bondholders can swap their old bonds for new bonds, which are more often senior, to give bondholders the required incentive to tender their bonds (Gilson et al., 1990, p. 322).

### 2.3. Behavior of retail investors

In this paper, we examine the role of retail investors during German bond issuers' bond restructuring attempts. Section 2 describes that bondholders are generally prone to several flaws, such as the holdout or holdup problems, and rational apathy. Retail investors may be particularly prone to rational

apathy, which in turn may be especially harmful for bond restructuring attempts, as the German Bond Act requires issuers to reach quorum thresholds in bondholder meetings in order to amend bond terms and restructure bonds.

Black (1990, pp. 584-591) shows through a simple model that larger shareholders who have economies of scale in becoming informed (e.g., because they vote on similar issues at multiple companies) are more likely to vote on shareholder approvals for governance changes. Small shareholders have low abilities and no economies of scale in becoming informed, so they remain uninformed and do not vote at all or vote with the management. Retail investors usually hold tiny stakes in public companies and, therefore, have limited influence in corporate decision-making, resulting in low incentives to become informed and to vote their shares. Instead, these investors rely on large shareholders to monitor management and effectively vote their shares, which is a form of free-riding by small investors (Nili & Kastiel, 2016, pp. 57-60). Recent evidence from shareholder meetings in the U.S. shows that the shareholder meeting participation rates of retail investors are significantly lower than the participation rates of institutional investors. ProxyPulse (2018, p. 4) shows that retail investors' participation rates in shareholder meetings have been an average of 28% between 2014 and 2018, while the participation rate of institutional investors has been an average of 90% for this period.

Beginning in 2010, German exchanges created new bond market segments, which were designed to particularly attract retail investors. Herrmann (2017) shows that retail investors held disproportionately higher shares in the bonds of bankrupt bond issuers of these market segments. The author attributes this to the inability of retail investors to properly distinguish between the quality of issuers. Herrmann and Stolper (2017) find that highly visible mini-bond issuers (issuers with strong brand recognition or high media visibility) carry significantly lower risk premiums. They conclude that familiarity of issuers reduces the perceived risk of an investment for retail investors.

In this paper, we connect and complement these two research streams. We acknowledge that retail investors are less active in corporate voting, as corroborated by academic research and data of shareholder meetings. The German Bond Act requires quorums in bondholder meetings to successfully amend bond terms. In case retail investors hold a large share of bonds, bond restructuring, and bond term amendments can become difficult. Therefore, in this paper, we take a different, yet innovative approach to investigate the impact of retail investors on corporate financial issues. By observing a detailed, hand-collected database of bondholder meetings in Germany, we examine how retail investors impact the ability of German corporate bond issuers to amend bond terms and successfully restructure bonds.

### 2.4. German bond market

This paper also contributes to the ongoing discussion regarding the recent developments and flaws in the German bond market, especially

<sup>6</sup> According to the German Bond Act of 1899, there are no quorum requirements in the second bondholder meeting, while under the new German Bond Act of 2009, a 25% quorum is required to amend the material bond terms.

the flaws associated with the so-called mini-bond markets. Mietzner, Proelss, and Schweizer (2017) state that rating agencies, who found themselves in fierce competition for business, issued highly favorable ratings in part for financially weak mini-bond issuers, causing rating inflation. Mini-bond ratings significantly understated the real default rates of these issuers. Compared to other European high-yield bond markets, mini-bonds contained very weak investor protection mechanisms, such as protective credit covenants, and displayed high default rates (von Randow, 2017, p. 160). Furthermore, Heß and Ueber (2013) observe that many mini-bond issuers failed to attract the desired issue volume, a phenomenon that is unknown in more mature market segments, where capital market placements are usually oversubscribed. The authors attribute this to the lack of or poor support by issuing agents such as investment banks. Feihle and Lawrenz (2017) find the poor post-issuance operating performance of mini-bond issuers compared to a control sample of SMEs and conclude adverse project quality and poor usage of the raised funds.

In summary, the current research on mini-bonds has focused on pricing at the time of issuance, the role of credit rating agencies in mispricing bonds, the role of issuance agents on a successful placement, and the post-issue performance of mini-bond issuers. As mentioned in Section 2, some research has been conducted on the role of retail investors in the mini-bond market (Herrmann, 2017; Herrmann & Stolper, 2017). We extend this research by examining the most critical situations in the lifecycle of bonds, namely restructuring. Here, we explicitly focus on how coordination or collective action problems of retail investors may complicate these situations.

## 2.5. Debt restructuring in Germany

This paper also complements the research available on debt restructuring in Germany, and mainly focuses on the role of banks during private debt restructuring, and emphasizes the importance of creditor coordination. Brunner and Krahn (2008) examine the distressed lending relations of German banks and focus on the drivers of successful private workouts. They find that banks frequently engage in the financial restructuring of troubled debtors and show that smooth coordination among banks is crucial for a successful private workout, which is facilitated by the formation of bank pools. Jostarndt and Sautner (2010) examine the drivers of successful debt restructuring of publicly listed companies in Germany. They show that “bargaining inefficiencies” (i.e., information opacity of debtors and coordination problems of creditors) and “institutional biases” of the German bankruptcy law against workouts are the main obstacles to successful debt restructuring. The paper confirms that creditor coordination in the form of bank pools is a key element to a successful debt restructuring.

We contribute to the research on debt restructuring and creditor coordination in Germany by offering the first study that explicitly focuses on bond restructuring and bondholder coordination in Germany.

## 3. HYPOTHESIS DEVELOPMENT

Based on the German Bond Act and the literature review, we formulate testable hypotheses. Overall, we are interested in understanding the efficiency of the German Bond Act when issuers need to amend bond terms and restructure bonds. We examine how bond holdings of retail investors impact the feasibility of the bond restructuring process. Our hypotheses are specifically tailored to the dataset under review and the regulations of the German Bond Act.

We assume that the German Bond Act regulations are issuer-friendly, given the collectively binding majority votes and, especially, the low quorum requirements, and expect issuers to be able to easily amend bond terms in bondholder meetings. We use three hypotheses to examine this assumption. First, we test how retail investors' holdings and their rational apathy impact the participation rates of bondholder meetings.

*H1 (Hypothesis 1): Participation rates of bondholder meetings are negatively related to retail investors' bond holdings.*

Second, we specifically test the ability to constitute quorums in bondholder meetings and how retail investors' bond holdings impact this ability. As mentioned above, to amend material bond terms, the German Bond Act requires a quorum of 50% of the bond capital in the first bondholder meetings and allows to schedule a second bondholder meeting, with a required quorum of only 25% of bond capital, in case the first meeting fails to successfully constitute a quorum. We hypothesize:

*H2 (Hypothesis 2): The likelihood of constituting a quorum in bondholder meetings is negatively related to the bond holdings of retail investors.*

Finally, we examine how retail investors' bond holdings impact the ability of issuers to restructure bonds. As the German Bond Act leaves issuers with two chances to successfully restructure bonds, we examine the first and second bondholder meetings together and focus on these “meeting sequences”<sup>7</sup>, and explicitly test for the impact of retail investors. We hypothesize:

*H3 (Hypothesis 3): The probability of a successful meeting sequence is negatively related to retail investors' bond holdings.*

## 4. DATASET AND VARIABLE DEFINITION

### 4.1. Sample selection and data sources

We use a hand-collected dataset of bondholder meetings that were conducted according to the German Bond Act of 2009. To collect this dataset, we ran an in-depth keyword search on *bundesanzeiger.de*, the digital version of *Bundesanzeiger*. *Bundesanzeiger* is a German Federal Gazette, published by the German department of Justice. It provides a central platform for pronouncements and announcements, as well as for legally relevant company news. Overall, we found 216 bondholder meetings of 99 bonds and 70 issuers, which were held between December 2010 and January 2018. We carefully examined the different invitation letters provided on

<sup>7</sup> A sequence means first and second bondholder meetings with the same meeting agenda or same voting items.

bundesanzeiger.de and extracted meeting agendas and voting items. In case bondholder meetings constitute a quorum, issuers need to disclose voting outcomes on bundesanzeiger.de (Sec 17 (1), German Bond Act) or on their personal websites (Sec 17 (2), German Bond Act). We supplemented the documents provided by bundesanzeiger.de with the official press releases of issuers and the documents provided by SdK e.V. (“Schutzgemeinschaft der Kapitalanleger”) or DIU e.V. (“Deutsche Investoren Union”), which are German investor associations that provide proxy voting for retail investors in bondholder meetings and regularly report about these meetings. The information provided by these associations especially helped us in collecting the participation rates of bondholder meetings, as this information was only fragmentarily available in the official documents provided on bundesanzeiger.de. We limited our focus on bondholder meetings that were convened to materially amend bond terms, and therefore required the mentioned quorum requirements of 50% and 25% in the first and second meetings, respectively, and approval rates of 75% (Sec. 5 (4) No. 2, Sec. 15 (3) No. 1 and No. 4, German Bond Act). We also included bondholder meetings that were called to conduct an opt-in from the old German Bond Act of 1899 into the German Bond Act of 2009, as the new law explicitly allows for this (Sec. 24, German Bond Act) and requires the same quorum and approval rates as the above-mentioned cases. This selection reduced our dataset to 139 meetings, 59 unique bonds, and 47 unique issuers.

## 4.2. Variable definition

### 4.2.1. Explained variables

In our empirical analysis, we attempt to explain the determinants for successful bondholder meetings and bond restructurings. Our main interest is to understand how retail investors impact the success probabilities of these situations. We use three variables, which are explained as follows. Given the quorum requirements of the German Bond Act, the first proxy or explained variable is the participation rate in bondholder meetings. This variable is defined as the share of bond capital present during a bondholder meeting. The next variable is a dummy variable that equals one if the bondholder meetings constituted a quorum and zero otherwise. For this analysis, we distinguish between first and second bondholder meetings, with quorum requirements and bond capital of 50% and 25%, respectively. The third proxy focuses on the successful or unsuccessful bond restructuring attempts. It is a dummy variable that equals one if an issuer achieved the aspired bond restructuring either in the first or second bondholder meeting. We label the combination of a first and subsequent second bondholder meeting as a “meeting sequence”.

### 4.2.2. Explanatory variables

We use issuer-, bond-, and bondholder meeting-specific explanatory variables. We test for the size of the bond and the bond issuer by using the issue size of the bond. We expect the issue size to be

negatively related to all the explained variables, as a larger bond is broadly held and drives participation rates down and lowers the probability to reach quorums and successfully restructure bonds. We test for the balance sheet strength and profitability of the issuers by using the equity ratio and ROA. We also define a set of dummy variables. First, we define a dummy variable that equals one if a bondholder meeting or meeting sequences were called to amend the material bond terms (“restructuring”) and zero if bondholders voted on other measures, mainly the opt-in into the German Bond Act of 2009 and other voting items (“non-restructuring”)<sup>8</sup>. However, it is important that both meeting types have the same quorum requirements of 50% in the first and 25% in the second meeting. Second, we also define a dummy variable that is equal to one if the bondholder meeting is a second meeting and expect this dummy to positively correlate with the participation rate and the probability to reach a quorum. In a second meeting, bondholders should be more aware of the importance to vote on their bonds, which should increase the participation rate, while reaching a quorum is considerably easier as the threshold is only 25% compared to 50% in the first meeting.

The explanatory variable of main interest is “bond holdings of retail investors”, which is the relative share of the nominal bond capital held by households or retail investors at the time of a bondholder meeting. These data are obtained from the “Micro Database: Securities Holdings Statistics” (SHS) database of Deutsche Bundesbank. This database contains a holding data split of each security held by customers of German financial institutions. A basic distinction is made between retail investors and various institutional investor groups, whereby for this paper we only work with the data for retail investors and do not focus on the institutional investors. The data are available on a quarterly basis until 2012 and on a monthly basis beginning in 2013. For the purpose of our analysis, we use the data points for the quarter and month in which the bondholder meetings were conducted; in the case of bondholder sequences, we use the month or quarter of the last meeting of the sequence. Please find detailed definitions of the different variables used in Table A.2 (see Appendix).

## 4.3. Summary statistics

### 4.3.1. Bondholder meetings

We introduce the data on which this paper is based and provide an overview of the summary statistics in Table 1. Overall, the sample consists of 139 bondholder meetings that were conducted between 2010 and the beginning of 2018, under the German Bond Act of 2009, and satisfied quorum requirements under Sec. 15 (3). Most of these meetings were held between 2013 and 2017, the period when several mini-bond issuers were restructured or defaulted on their bonds.

<sup>8</sup> See Sec. 5 (3) No. 1–10, German Bond Act of 2009, for an overview of the different material bond term amendments.

**Table 1.** Issuers, bonds, bondholder meetings, and meeting sequences

Year	Issuers		Bonds		Bondholder meetings		Meeting sequences	
	Number	% of sample	Number	% of sample	Number	% of sample	Number	% of sample
2010	1	1.4%	1	1.1%	2	1.4%	1	1.1%
2011	5	6.8%	7	7.7%	11	7.9%	7	7.7%
2012	6	8.2%	8	8.8%	9	6.5%	8	8.8%
2013	6	8.2%	11	12.1%	17	12.2%	11	12.1%
2014	12	16.4%	12	13.2%	18	12.9%	12	13.2%
2015	14	19.2%	16	17.6%	24	17.3%	15	16.5%
2016	16	21.9%	20	22.0%	32	23.0%	20	22.0%
2017	12	16.4%	13	14.3%	22	15.8%	14	15.4%
2018	1	1.4%	3	3.3%	4	2.9%	3	3.3%
<b>Total</b>	<b>73</b>	<b>100.0%</b>	<b>91</b>	<b>100.0%</b>	<b>139</b>	<b>100.0%</b>	<b>91</b>	<b>100.0%</b>

Notes: This table reports the number of issuers, bonds, bondholder meetings, and meeting sequences of the dataset used, which were held according to the German Bond Act of 2009 with voting items and quorum requirement according to Sec. 15 (3). The issuer, bond, and meeting sequence columns include double counts, as bonds and issuers held bondholder meetings and restructured bonds multiple times. All the meeting sequences that took place over two years were counted only in the last year.

In Table 2, we subdivide the 139 bondholder meetings into first and second meetings and distinguish between “Restructuring” and “Non-restructuring” meetings. The sample of 139 bondholder meetings is split between 91 first bondholder meetings, of which only 34 constituted

a quorum, and 48 second bondholder meetings of which 40 meetings constituted a quorum. This shows that although quorum requirements were low for the first bondholder meetings, bond restructuring attempts usually need a second bondholder meeting for the required quorum.

**Table 2.** Types of bondholder meetings and meeting sequences

	First bondholder meeting		Second bondholder meeting		All bondholder meetings	
	Number	% of sample	Number	% of sample	Number	% of sample
<b>Split between bondholder meeting types</b>						
<i>Restructuring</i>	76	54.7%	42	30.2%	118	84.9%
Quorum constituted	29	20.9%	36	25.9%	65	46.8%
Quorum not constituted	47	33.8%	6	4.3%	53	38.1%
<i>Non-restructuring</i>	15	54.7%	6	4.3%	21	15.1%
Quorum constituted	5	20.9%	4	2.9%	9	6.5%
Quorum not constituted	10	33.8%	2	1.4%	12	8.6%
<b>Total</b>	<b>91</b>	<b>65.5%</b>	<b>48</b>	<b>34.5%</b>	<b>139</b>	<b>100.0%</b>
Quorum constituted	34	24.5%	40	28.8%	74	53.2%
Quorum not constituted	57	41.0%	8	5.8%	65	46.8%

Notes: This table divides the 139 bondholder meetings of the dataset into first and second meeting, and reports if the meetings constituted quorums. Under “Restructuring” we show bondholder meetings with major amendments of the financial bond terms according to Sec. 5 (3) No. 1-10 of the German Bond Act. “Non-restructuring” are bondholder meetings and other voting items, which do not amend major bond terms but have voting provisions according to Sec. 15 (3) of the German Bond Act. The quorum constitution threshold in the first bondholder meeting is 50% of the bond capital, while the threshold in the second meeting is 25% of the bond capital.

In Table 3, we combine first and second bondholder meetings to constitute a “bondholder meetings sequence”. Overall, we find 91 sequences, which we subdivide into “Restructuring”, “Non-restructuring”, “Successful” and “Not successful” sequences. “Successful”, in this case, is more narrowly defined than “Quorum constituted”, as this classification requires that either the first or second bondholder meeting of the sequence constituted a quorum and bondholders approved the proposed voting items. The latter condition is usually not very difficult to meet, as the approval rates in bondholder meetings are usually high (see Appendix, Table A.3, for a descriptive overview of approval rates of bondholder meetings). Interestingly, the success rate of these sequences is high at 78.0%, or 71 of the 91 sequences which are successful. In addition, 62 of the 75 “Restructuring” sequences were successful (success rate of 82.7%), indicating that issuers were highly successful in either amending bond terms or restructuring bonds, respectively.

Table 4 provides an overview of the 338 voting items brought forward in bondholder meetings, subdivided into “Restructuring items”, “Non-restructuring items”, “Successful”, and “Not successful” votes, and first and second bondholder meetings. Not surprisingly, it shows that bond restructurings are more often successful in the second bondholder meetings (88 successful vs. 21 not successful voting items), while it seems to be difficult to restructure bonds in first bondholder meetings (68 successful vs. 132 not successful voting items). The same holds for “Non-restructuring voting items”, where 10 successful voting items contrast with 11 not successful voting items in the first meeting, whereas in the second bondholder meetings, 7 successful items compare to only 1 unsuccessful item. Based on these descriptive statistics, it can be observed that the German Bond Act of 2009 seems to enable the easy adjustment of bond terms and the restructuring of bonds.

Table 3. Types of bondholder meeting sequences

	Includes only first bondholder meeting		Includes also second bondholder meeting		All bondholder meeting sequences	
	Number	% of sample	Number	% of sample	Number	% of sample
<i>Split between bondholder meeting sequences</i>						
<i>Restructuring</i>	33	36.3%	42	46.2%	75	82.4%
Successful	28	30.8%	34	37.4%	62	68.1%
Not successful	5	5.5%	8	8.8%	13	14.3%
<i>Non-restructuring</i>	10	11.0%	6	6.6%	16	17.6%
Successful	5	5.5%	4	4.4%	9	9.9%
Not successful	5	5.5%	2	2.2%	7	7.7%
<i>Total</i>	43	47.3%	48	52.7%	91	100.0%
Successful	33	36.3%	38	41.8%	71	78.0%
Not successful	10	11.0%	10	11.0%	20	22.0%

Notes: This table divides the 91 bondholder meeting sequences of the dataset into sequences which included only one meeting or two meetings. Under "Restructuring," we show sequences with voting items to materially amend bond terms according to Sec. 5 (3) No. 1-10 of the German Bond Act. "Non-restructurings" are sequences that included voting items to not amend major bond terms but with voting provisions according to Sec. 15 (3) of the German Bond Act. A sequence is "Successful" when bondholders agreed to the main voting items. A sequence is "Not successful" when bondholders rejected the main voting items, the participation rate of the bondholder meeting was very low, or the meeting was cancelled.

Table 4. Voting items in bondholder meetings

	First bondholder meeting				Second bondholder meeting				All bondholder meetings <sup>a</sup>				Total	
	Successful		Not successful		Successful		Not successful		Successful		Not successful			
	Number	% of sample	Number	% of sample	Number	% of sample	Number	% of sample	Number	% of sample	Number	% of sample	Number	% of sample
<i>Voting items</i>														
<i>Restructuring items</i>	68	20.1%	132	92.3%	88	26.0%	21	6.2%	156	46.2%	153	45.3%	309	91.4%
Haircut	3	0.9%	6	4.2%	3	0.9%	1	0.3%	6	1.8%	7	2.1%	13	3.8%
Loan life adjustment	11	3.3%	21	14.7%	13	3.8%	3	0.9%	24	7.1%	24	7.1%	48	14.2%
Coupon adjustment	11	3.3%	18	12.6%	9	2.7%	3	0.9%	20	5.9%	21	6.2%	41	12.1%
Deferment agreement	6	1.8%	13	9.1%	7	2.1%	4	1.2%	13	3.8%	17	5.0%	30	8.9%
Foregone interest payments	3	0.9%	4	2.8%	3	0.9%	1	0.3%	6	1.8%	5	1.5%	11	3.3%
Debt-equity swap	5	1.5%	8	5.6%	7	2.1%	0	0.0%	12	3.6%	8	2.4%	20	5.9%
Debt-debt swap	1	0.3%	3	2.1%	3	0.9%	0	0.0%	4	1.2%	3	0.9%	7	2.1%
Abandonment of right of cancellation	4	1.2%	15	10.5%	10	3.0%	4	1.2%	14	4.1%	19	5.6%	33	9.8%
Authorization of joint representative to negotiate bond term amendments	3	0.9%	16	11.2%	12	3.6%	4	1.2%	15	4.4%	20	5.9%	35	10.4%
Other restructuring measures	21	6.2%	28	19.6%	21	6.2%	1	0.3%	42	12.4%	29	8.6%	71	21.0%
<i>Non-restructuring items</i>	10	12.8%	11	7.7%	7	2.1%	1	0.3%	17	5.0%	12	3.6%	29	8.6%
Authorization of joint representative for non-bond restructuring measures	3	3.8%	2	1.4%	1	0.3%	1	0.3%	4	1.2%	3	0.9%	7	2.1%
Opt-in German Bond Act 2009	7	9.0%	9	6.3%	6	1.8%	0	0.0%	13	3.8%	9	2.7%	22	6.5%
<i>Total</i>	78	23.1%	143	42.3%	95	28.1%	22	6.5%	173	51.2%	165	48.8%	338	100.0%

Notes: This table reports the 338 voting items, which were put for vote during bondholder meetings. Voting items were identified based on documents provided by bundesanzeiger.de. Under "Restructuring items," we show major amendments of the financial bond terms according to Sec. 5 (3) No. 1-10 of the German Bond Act. "Non-restructuring items" are other voting items that do not amend major bond terms but have voting provision according to Sec. 15 (3) of the German Bond Act. "Successful" is a voting item when bondholders approved the item with the necessary vote majority and participation rate. "Not successful" is a voting item when bondholders either did not approve the item or the participation rate of the bondholder meeting was very low and failed to constitute a quorum.



Based on intensive research of bondholder meetings, we uncovered the participation rates of 80 bondholder meetings and provide the basic descriptive statistics in Table 5. The mean and median participation rates are 35.9% and 35.3%, while participation rates do not differ significantly between the first and second bondholder meetings. Only the standard deviation differs between the meeting types, where fluctuations in the participation rates are higher for first bondholder meetings. The participation rates are considerably lower than data from the U.S., where Mann and Powers (2007) find for a sample of bond tender offers mean and median participation rates of 82.3% and 95.6%, respectively, while Danis (2016) finds

mean and median participation rates of 55% and 56% for a sample of distressed exchanges, respectively. Thus, it is obvious that only due to the low quorum requirements of the German Bond Act, bond term amendments or bond restructurings are feasible in the German Bond market at all. Participating in bondholder meetings becomes more attractive the more investor-friendly legal requirements are. In Germany, the regulations according to the German Bond Act significantly differ from the U.S. Trust Indenture Act. They define collectively binding majority votes and very low quorum requirements which widely mitigate holdout and holdup problems. Both rules can be considered to be issuer friendly regulations.

**Table 5.** Participation rates of bondholder meetings

	<i>First bondholder meetings</i>	<i>Second bondholder meetings</i>	<i>All bondholder meetings</i>
Number	46	34	80
Mean	36.1%	35.5%	35.9%
Median	37.0%	34.9%	35.3%
St. Dev.	19.7%	13.0%	17.0%
Dif. Mean	0.7% <i>not significant</i>		
Dif. Median	2.2% <i>not significant</i>		
Dif. St. Dev.	6.7%**		

Notes: This table reports the mean, median, and standard deviation comparisons of 80 bondholder meetings, for which we obtained participation rates. The differences between means are tested by t-tests, between medians by the Wilcoxon/Mann-Whitney tests, and differences between the standard deviations are tested by F-test.

\*\*\*, \*\*, and \* indicate statistical significance of 1%, 5%, and 10% level, respectively.

Finally, Table 6 shows the descriptive statistics of the bond holdings of retail investors of bonds for which bondholder meetings have been conducted. The mean and median bond holdings of retail investors in the 139 bondholder meetings in our dataset are 51.6% and 53.7%, respectively. Interestingly, retail investors' bond holdings are higher in

the second bondholder meeting compared to the first bondholder meeting. This gives a first indication of the difficulties retail investors' high bond holdings may entail for bond issuers. In addition, the share of bond holdings of retail investors in the dataset declined slightly after 2015.

**Table 6.** Bond holdings of retail investors in bondholder meetings

Year	<i>First bondholder meeting</i>			<i>Second bondholder meeting</i>			<i>All bondholder meetings</i>		
	Number	Mean	Median	Number	Mean	Median	Number	Mean	Median
2010	1	77.4%	77.4%	1	77.4%	77.4%	2	77.4%	77.4%
2011	7	49.4%	44.6%	4	75.9%	85.3%	11	41.1%	84.1%
2012	8	55.2%	55.2%	1	75.8%	75.8%	9	76.6%	75.8%
2013	11	65.1%	62.4%	6	64.4%	61.4%	17	52.0%	62.2%
2014	13	49.6%	53.0%	5	54.8%	56.3%	18	45.6%	54.3%
2015	16	43.5%	50.2%	8	49.9%	56.9%	24	57.3%	56.2%
2016	19	49.2%	52.2%	13	51.5%	52.3%	32	52.9%	52.3%
2017	14	46.2%	46.2%	8	45.6%	47.8%	22	56.1%	46.2%
2018	2	12.8%	12.8%	2	47.8%	47.8%	4	54.6%	24.2%
Total	91	49.8%	51.3%	48	55.1%	56.3%	139	51.6%	53.7%

Notes: This table presents mean and median bond holdings of retail investors in the 139 bondholder meetings of the dataset. Each observation represents the share of bond holdings by retail investors during a unique bondholder meeting. Bondholding data of retail investors were obtained from "Microdatabase: Securities Holdings Statistics" of Deutsche Bundesbank.

#### 4.3.2. Bonds and bond issuers

The descriptive statistics of bond issuers and bonds are presented in Table 7. We used financial data from the last available annual report published prior to the bondholder meeting. In Panel A we show the fundamental descriptive statistics of bond issuers. Bond issuers are small with mean and median total assets of EUR 219.2 million and EUR 57.3 million, respectively. The profitability of the sample issuers is negative, with mean and median ROA of -7.2% and -1.4%, respectively. This is not surprising as many of the issuers call for bondholder meetings as their financial conditions are weak or because they face bankruptcy. In addition, sample issuers also display relatively

poor capital resources, with mean and median equity ratios of 11.2% and 11.6%, respectively, which complements the finding from the weak profitability.

Next, we focus on Panel B of Table 7 and discuss the fundamental characteristics of the sample bonds. Bonds are rather small with mean and median sizes of only EUR 45.6 million and EUR 22.0 million, respectively. This is consistent with expectations as a major part of the sample bonds is from one of the mini-bond segments, where minimum issue sizes are only EUR 10.0 million. Another important point is the mean and median coupon sizes of 7.3% and 7.4%, respectively. Again, this results from the fact that many bonds are mini-bonds, where issuers had to attract retail investors with high coupon interest rates.

Table 7. Fundamental characteristics of sample issuers and bonds

<b>Panel A: Fundamental characteristics of sample issuers</b>						
	<b>Mean</b>	<b>Median</b>	<b>St. Dev.</b>	<b>Min.</b>	<b>Max.</b>	<b>Number</b>
Total assets (EUR million)	219.2	57.3	377	4.0	1 655.5	139
Return on assets	-7.2%	-1.4%	15.3%	-52.3%	10.0%	139
Equity ratio	11.2%	11.6%	17.4%	-42.5%	38.1%	139
<b>Panel B: Fundamental characteristics of sample bonds</b>						
	<b>Mean</b>	<b>Median</b>	<b>St. Dev.</b>	<b>Min.</b>	<b>Max.</b>	<b>Number</b>
Issue size (EUR million)	45.6	22.0	73.8	0.8	364.0	139
Time-to-maturity	5.4	5.0	1.4	3.0	10.0	139
Coupon	7.3%	7.4%	1.3%	4.0%	9.3%	139

Notes: This table reports the mean and median fundamental characteristics of the sample issuers and sample bonds. Variables for the fundamental characteristics of issuers are calculated based on the last available annual report prior to the bondholder meeting. Variables for characteristics of bonds are calculated based on time of issuance. All the variables are winsorized at 2.5% level on both sides. Table A.2 in Appendix provides detailed definitions of the fundamental characteristics.

## 5. EMPIRICAL STRATEGY AND RESULTS

### 5.1. Determinants of participation rates and quorum constitution in bondholder meetings

Our first analysis is about the drivers of bondholder meeting participation rates. We use an OLS regression analysis to test the impact of different explanatory variables, with “bond holdings of retail investors” being the variable of major interest. For each of

the following regression models, we work with standard error estimates that are robust to heteroscedasticity by using the Huber-White standard errors. We check for multicollinearity by calculating the variance inflation factors (VIFs), which we denote in the tables as a description. We ensure that the maximum VIF for each table stays below the critical value of 10, which is recommended by Wooldridge (2016, p. 86). The OLS regression takes the following form:

$$\text{Participation rate (\%)} = \Phi\{\beta_0 + \beta_1(\text{bond holdings of retail investors} + \beta_i x_i) + e_i \quad (1)$$

where,  $\beta_1$  is the coefficient for bond holdings of retail investors and  $\beta_i x_i$  is a vector with

a combination of issuer-, bond-, and bondholder meeting-specific variables.

Table 8. Ordinary least square analysis of bondholder meeting participation rates

<b>Independent variables</b>	<b>Dependent variables: Bondholder meeting participation rate (%)</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
Intercept	0.7090*** (0.0763)	0.7813*** (0.0613)	0.7823*** (0.0589)	0.7839*** (0.0575)	0.6177*** (0.0575)
Bond holdings of retail investors (%)	-0.5737*** (0.0978)	-0.5861*** (0.0960)	-0.5868*** (0.0986)	-0.5694*** (0.0942)	-0.5378*** (0.1007)
Bond issue volume (log)	-0.0638*** (0.0164)	-0.0614*** (0.0154)	-0.0570*** (0.0133)	-0.0517*** (0.0140)	
Second bondholder meeting (dummy)	0.0553 (0.0332)	0.0510 (0.0339)	0.0485 (0.0326)		
Equity ratio (%)	0.0477 (0.1128)	0.0324 (0.1116)			
Return on assets (%)	-0.0900 (0.1391)	-0.0999 (0.1391)			
Restructuring of bond terms (dummy)	0.0739 (0.0559)				
Year control dummies	YES	YES	YES	YES	YES
Adj. R <sup>2</sup>	0.3930	0.3898	0.4025	0.3924	0.3068
Number of observations	80	80	80	80	80

Notes: This table reports the results from the OLS regression model for bondholder meeting participation rates. The dependent variable is the participation rate (%) of the different bondholder meetings. Independent variables which are not dummy variables are winsorized at 2.5% level on both sides. Huber-White-heteroscedasticity consistent standard errors are given in parentheses below the coefficients. Investigating the variance inflation factors (VIFs) reveals no multicollinearity, as the mean VIF is 1.57 and the maximum VIF is 2.75.

\*\*\*, \*\*, and \* indicate statistical significance at 1%, 5%, and 10% level, respectively. Table A.2 in Appendix provides detailed definitions of the fundamental characteristics.

Table 8 shows the results. In Model (1), we use the full set of available variables, while in Models (2) to (6) we eliminate one variable after the other until only our major variable “bond holdings of retail investors” remains in Model (6). The coefficients for “bond holdings of retail investors” display significantly negative values between -0.54 to -0.59 on a 1% level in each model. This indicates that higher bond holdings of retail investors negatively impact participation rates in bondholder meetings. For each percentage of bond holdings of retail

investors, participation rates in bondholder meetings decline by about 0.54 to 0.59 percentage points. Participating in a bondholder meeting requires effort and costs for each investor which typically more or less do not depend on investment volume. Therefore, a rationally acting investor who weighs the costs and benefits of participating in a bondholder meeting will typically decide not to participate if her investments are rather small as in the case of retail investors in the German mini-bond market.

This result appears to be critical with respect to the origin of the German mini-bond market and the insolvency code. The implementation of the German corporate mini-bond market took place in coincidence with the reform of the German Insolvency Code of 2012 which was intended to facilitate earlier insolvency filing by corporate debtors and higher recovery rates for creditors. A larger number of issuers in the mini-bond market were confronted with credit rationing by their relationship lenders and rated as subprime debtors (Mietzner et al., 2017). This borrowing history made them become typical targets of the new insolvency code. The low face values and minimum investment amount of only 1,000 euros are characteristics that underline that mini-bonds were designed to attract retail investors. However, these retail investors aggravated to constitute a quorum which prolongates the restructuring process — an interdependency between insolvency code and mini-bond design.

In addition, the coefficients of bond issue volumes are significantly negative, which indicates that the participation rates are lower if the bond issue is larger. Intuitively, this makes sense, as larger bonds are probably more broadly held, and therefore it is more difficult to assemble bondholders to vote during bondholder meetings. The other bond- and meeting-specific variables are

not significant. The dummy variable for the second bondholder meeting is positive, yet not significant. This means that the analysis reveals no indication that the second bondholder meetings do not display significantly higher participation rates than the first bondholder meetings. This finding is in line with the evidence from the descriptive statistics in Table 5, where we show that average participation rates are not statistically different between the first and second bondholder meetings. Also, the dummy variable for restructuring the bond terms is not significant which indicates that bondholders do not distinguish between “Restructuring” and “Non-restructuring” issues when deciding to attend a bondholder meeting. Lastly, issuer-specific variables are not significant, which indicates that bondholders do not distinguish between issuer qualities when they decide to attend and vote in bondholder meetings. Overall, given the significantly negative coefficients for holdings of retail investors, we find strong evidence for *H1*.

The next analysis concerns the probability to constitute quorums during bondholder meetings. We use a probit regression model to test for the impact of holdings of retail investors. In this set of regressions, the dependent variable equals one if the meeting constituted a quorum and zero otherwise. The final probit regressions take the general form:

$$Pr(\text{Quorum constitution} = 1|x_i) = \Phi\{\beta_0 + \beta_1(\text{bond holdings of retail investors}) + \beta_i x_i\} + e_i \quad (2)$$

where,  $\beta_1$  is the coefficient for bond holdings of retail investors, which is our variable of main interest, while  $\beta_i x_i$  is a vector with a combination of bond-, issuer, and bondholder meeting-specific variables. We use the same set of variables as in the previous analysis. Table 9 documents the results. Bond holdings of retail investors have a negative impact on the probability to constitute quorums during bondholder meetings. In each of the models, the coefficients are significantly negative. This provides positive evidence with respect to *H2*.

In addition, the models display significantly negative coefficients for the issue volume of bonds, which indicates that the larger the issue volume of the bond, the more difficult it is to commit bondholders to participate in bondholder meetings and to finally constitute the quorums. The different models also yield positive and highly significant coefficients for the second bondholder meeting

dummy, which is of course not surprising, as these meetings benefit from the lower quorum requirements of only 25% of bond capital. Overall, the dummy variable for the second bondholder meeting has strong explanatory power, which can be seen when comparing the McFadden  $R^2$  values of Model (3), where we included the dummy, and Model (4), where we renounced this variable. The McFadden  $R^2$  decreases from 0.2703 in Model (3) to only 0.0811 in Model (4). In contrast to the results presented in Table 8, issuer characteristics display significant coefficients, as the coefficients for ROA are significantly positive. This indicates that more profitable issuers find it easier to constitute quorums during bondholder meetings. We are aware that the interpretation of results has carefully taken into consideration the possibility of endogeneity which otherwise cannot be overcome given the data at hand.

**Table 9.** Probit model of quorum constitution in bondholder meetings

<i>Independent variables</i>	<i>Dependent variables: Dummy variable for quorum constitution</i>				
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>
Intercept	0.9995	1.2931***	1.1141**	1.2625***	0.6502**
	(0.6827)	(0.4866)	(0.5006)	(0.4691)	(0.3185)
	<i>0.3952</i>	<i>0.5113</i>	<i>0.4411</i>	<i>0.5012</i>	<i>0.2583</i>
Bond holdings of retail investors (%)	-2.0787***	-2.1728***	-1.8307***	-1.2704***	-1.2515***
	(0.6371)	(0.6185)	(0.5914)	(0.4763)	(0.4525)
	<i>-0.7723</i>	<i>-0.8591</i>	<i>-0.7247</i>	<i>-0.5043</i>	<i>-0.4972</i>
Bond issue volume (log)	-0.2437**	-0.2439**	-0.2977***	-0.2147**	
	(0.1117)	(0.1117)	(0.1097)	(0.0988)	
	<i>-0.0963</i>	<i>-0.0964</i>	<i>-0.1179</i>	<i>-0.0852</i>	
Second bondholder meeting (dummy)	1.6678***	1.6727***	1.5595***		
	(0.2938)	(0.2935)	(0.2926)		
	<i>0.6594</i>	<i>0.6614</i>	<i>0.6174</i>		
Equity ratio (%)	-0.9299	-0.9892			
	(0.9777)	(0.9698)			
	<i>-0.3677</i>	<i>-0.3911</i>			
Return on assets (%)	2.6613**	2.5624**			
	(1.1941)	(1.2155)			
	<i>1.0523</i>	<i>1.0132</i>			
Restructuring of bond terms (dummy)	0.2523				
	(0.4318)				
	<i>0.0997</i>				
Year control dummies	YES	YES	YES	YES	YES
McFadden R <sup>2</sup>	0.3030	0.3013	0.2703	0.0811	0.0546
Observations with Dep = 0	65	65	65	65	65
Observations with Dep = 1	74	74	74	74	74

Notes: This table reports the results from the probit regression model for quorum constitution during bondholder meetings. The dependent variable is a dummy that is equal to one if the bondholder meeting constitutes a quorum and zero otherwise. The independent variables, which are not dummy variables are winsorized at 2.5% level on both sides. Huber-White-heteroscedasticity consistent standard errors are shown in parentheses below the coefficients, and marginal effects are shown below the standard errors in italics. Investigating the variance inflation factors (VIFs) reveals no multicollinearity, as the mean VIF is 1.50 and the maximum VIF is 2.13.

\*\*\*, \*\*, and \* indicate statistical significance at 1%, 5%, and 10% level, respectively. Table A.2 in Appendix provides detailed definitions of the fundamental characteristics.

## 5.2. Determinants of successful bond restructuring attempts

In the final part of our analysis, we test *H3* for the impact of retail investors on the success probability of bond restructuring attempts. This is the most important analysis, as it provides direct evidence if retail investors impede a bond

restructuring process. For this purpose, we no longer focus only on single bondholder meetings, but examine consecutive bondholder meetings of the same bond, or the “meeting sequence”. We use a probit model to examine the drivers of success in these meeting sequences, which takes the following form:

$$Pr(\text{Sequence success} = 1|x_i) = \Phi\{\beta_0 + \beta_1(\text{bond holdings of retail investors}) + \beta_i x_i\} + e_i \quad (3)$$

where,  $\beta_i x_i$  is a vector with bond-, bondholder meeting-, and issuer-specific variables and  $\beta_1$  is the coefficient for bond holdings of retail investors. Table 10 shows the results. First, the McFadden R<sup>2</sup> values are considerably lower than in Table 9, which indicates that the predictive power of the models in Table 10 is weaker. In addition, none of the bond- or issuer-specific variables display statistically significant coefficients. For example, the coefficients for bond issue volume are insignificant, in contrast to the models in Table 8 and Table 9, which display significantly negative coefficients for this variable. This is interesting and encouraging for issuers: by examining consecutive first and second bondholder meetings as the connected observation units, there is no evidence that the issue volume has a significant impact on the probability of successfully conducting these meetings. The coefficients for

restructuring bond terms and the proxies for profitability and balance sheet strength of the issuer are not significant and do not seem to play a role here, which is by and large in line with the previous finding in this paper. Most importantly for our analysis, the coefficients for bond holdings of retail investors are significantly negative in Models (2) to (5), even though only at a 5% level in Model (2) and 10% level in Models (3) to (5). This provides evidence that bond holdings of retail investors impede bond restructuring efforts. By observing the marginal effects of this variable, it is observed that an increase in the holdings of retail investors by one percentage point reduces the probability to successfully conduct the bond restructuring attempt by *circa* 0.3%. Overall, our findings provide evidence for *H3*.

**Table 10.** Probit selection outcome model for successful restructuring sequence

<i>Independent variables</i>	<i>Dependent variables: Dummy variable for successful bondholder meeting sequence</i>				
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>
Intercept	1.0652	1.7797***	1.7139**	1.7284**	1.5164***
	(0.7351)	(0.6285)	(0.6801)	(0.7019)	(0.4388)
Holdings of retail investors (%)	<i>0.2909</i>	<i>0.4905</i>	<i>0.4814</i>	<i>0.4850</i>	<i>0.4265</i>
	-0.8275	-1.2460**	-1.0380*	-1.0266*	-1.0236*
	(0.6725)	(0.6334)	(0.6068)	(0.5671)	(0.5513)
Bond issue volume (log)	-0.2260	-0.3434	-0.2916	-0.2881	-0.2879
	-0.0398	-0.0419	-0.0746	-0.0731	
	(0.1442)	(0.1384)	(0.1374)	(0.1343)	
Second bondholder meeting (dummy)	-0.0109	-0.0115	-0.0209	-0.0205	
	0.0325	0.1324	0.0366		
	(0.3734)	(0.3563)	(0.3457)		
Equity ratio (%)	<i>0.0089</i>	<i>0.0365</i>	<i>0.0103</i>		
	-0.1921	-0.4511			
	(1.3705)	(1.4010)			
Return on assets (%)	-0.0525	-0.1243			
	2.1531	1.9137			
	(1.3617)	(1.3692)			
Restructuring of bond terms (dummy)	<i>0.5880</i>	<i>0.5275</i>			
	0.6995*				
	(0.4038)				
Year control dummies	<i>0.1910</i>				
McFadden R <sup>2</sup>	YES	YES	YES	YES	YES
Observations with Dep = 0	0.1405	0.1155	0.0944	0.0942	0.0903
Observations with Dep = 1	20	20	20	20	20
	71	71	71	71	71

Notes: This table reports the results from the Probit regression model for successful restructuring sequences. The dependent variable is a dummy variable which is equal to one if the restructuring sequence is completed successfully and zero otherwise. Huber-White-heteroscedasticity consistent standard errors are shown in parentheses below the coefficients and marginal effects are shown below the standard errors in italics. Investigating the variance inflation factors (VIFs) reveals no multicollinearity, as the mean VIF is 1.98 and the maximum VIF is 2.97.

\*\*\*, \*\*, and \* indicate statistical significance at 1%, 5%, and 10% level, respectively. Table A.2 in Appendix provides detailed definitions of the fundamental characteristics.

## 6. ROBUSTNESS TESTS

To test our main findings, we ran robustness tests for each analysis in Table 8, Table 9, and Table 10. For this purpose, we subdivided the observation period into two sections, the first section for the period from 2010 to 2015 and the second section from 2016 to 2017. Both sections are roughly equally large regarding the number of bondholder meetings and meeting sequences. In Table A.4 (Appendix), we show the robustness test for Table 8, where we tested the drivers of the bondholder meeting participation rate. For both subsamples, our variable of main interest “bond holdings of retail investors” is significantly negative in each of the ten models. This makes us confident about the assessment of *H1*. In Table A.5 (Appendix), we show the robustness test for Table 9, where we tested the drivers of constituting a quorum in bondholder meetings. The first subsample with bondholder meetings between 2010 and 2015 yields the same results as our main analysis in Table 9, namely that the coefficients for holdings of retail investors are significantly negative in each model. The other control variables also show similar results as in Table 9: the coefficients of the second bondholder meeting dummy are significantly positive, while the coefficients for the issue volume are negative and significant. In contrast, for the second subsample for the period from 2016 to 2018, the coefficients for our main variable of interest are negative but not significant. Moreover, the control variables issue volume, which was significant in our main analysis and in the first subsample of the robustness test, is insignificant. A similar pattern is shown in Table A.6 (Appendix),

where we ran the robustness test for Table 10. In the first subsample, the coefficients for holdings of retail investors are significantly negative but do not display any statistical significance in the second subsample. The findings of the robustness tests in Table A.5 and Table A.6 indicate the difficulty to successfully conduct bondholder meetings to amend bond terms and to restructure bonds, respectively, has diminished over time. This could be driven by the learning effects of bond issuers and their commercial and legal advisors who figured out how successfully conduct bond restructuring processes, despite significant holdings by retail investors. Another explanation for these results could be that the share of retail bondholders declined slightly after 2015 and therefore their negative impact on bond restructuring diminished somewhat.

## 7. CONCLUSION

This paper analyzes how retail investors impact the ability of bond issuers to amend bond terms during bondholder meetings regulated under the German Bond Act of 2009. This law was designed to broaden available restructuring measures and to address some of the well-known problems of bond restructuring, namely collective action and collective representation. By focusing on a hand-collected dataset of bondholder meetings we show that the German Bond Act is well-suited to counteract most of these problems, as most bond restructuring attempts in our dataset were finally successful.

However, we provide evidence for the rational apathy problems of retail investors and assume that these investors impede successful bond restructuring: First, we show that holdings of retail investors

negatively impact the participation rate in bondholder meetings. Second, we find that holdings of retail investors also negatively impact the probability to constitute quorums in bondholder meetings. Finally, we show that holdings of retail investors also negatively impact the ability to successfully deliver bond restructuring attempts. Therefore, we assume that the legal provisions of the German Bond Act do not completely resolve the rational apathy problem of bondholders during bond restructurings.

Our findings are especially relevant since shortly after the introduction of the German Bond Act, mini-bond segments were launched on different German exchanges. Particularly, retail investors were attracted to subscribe to the different mini-bond issues. Our analysis shows the negative effects of the market entry of this unsophisticated investor group on the German Bond market. In addition, our analysis is relevant for low-quality German debtors who face a tradeoff when determining how to tap

the debt market. On the one hand, it is easier to convince unsophisticated retail investors to subscribe to low-quality bond issues, as shown by Herrmann (2017). On the other hand, these issuers must be aware that during financial difficulties, it is more difficult to successfully amend bond terms and save the issuer from financial distress when a large share of bonds is held by retail investors. For these issuers, it might be advisable to take out loans issued by other more concentrated non-bank creditors such as private debt funds. As our study focuses on the mini-bond segment, it would be interesting to find out if retail investors of larger, or even benchmark bond issues, act differently. Also, as the number of stock-listed issuers in our sample is quite small (only 36 out of 73 issuers), we did not include an analysis that focuses on stock-listed issuers. A study with larger sample size is left as an approach for further research.

## REFERENCES

- Achleitner, A.-K., & Volk, S. (2013). Anleihen und Schuldscheindarlehen als Finanzierungsinstrumente. *Corporate Finance*, 4(3), 157-169.
- Asquith, P., Gertner, R., & Scharfstein, D. (1994). Anatomy of financial distress: An examination of junk-bond issuers. *The Quarterly Journal of Economics*, 109(3), 625-658. <https://doi.org/10.2307/2118416>
- Bade, M., Flory, J., Gomolka, M., & Schönberg, T. (2019). *Securities holdings statistics base plus: Data report 2019-02 – Metadata Version 2-0*. <https://doi.org/10.12757/Bbk.SHSBaseplus.05121812>
- Becker, B., & Josephson, J. (2016). Insolvency resolution and the missing high-yield bond markets. *The Review of Financial Studies*, 29(10), 2814-2849. <https://doi.org/10.1093/rfs/hhw014>
- Berglöf, E., & von Thadden, E.-L. (1994). Short-term versus long-term interests: Capital structure with multiple investors. *Quarterly Journal of Economics*, 109(4), 1055-1084. <https://doi.org/10.2307/2118356>
- Black, B. S. (1990). Shareholder passivity reexamined. *Michigan Law Review*, 89(3), 520-608. <https://doi.org/10.2307/1289384>
- Bolton, P., & Freixas, X. (2000). Equity, bonds, and bank debt: Capital structure and financial market equilibrium under asymmetric information. *Journal of Political Economy*, 108(2), 324-351. <https://doi.org/10.1086/262121>
- Bolton, P., & Scharfstein, D. S. (1996). Optimal debt structure and the number of creditors. *Journal of Political Economy*, 104(1), 1-25. <https://doi.org/10.1086/262015>
- Brunner, A., & Krahn, J. P. (2008). Multiple lenders and corporate distress: Evidence on debt restructuring. *The Review of Financial Studies*, 21(2), 415-442. <https://doi.org/10.1111/j.1467-937X.2008.00483.x>
- Cagalj, K. I. (2013). *Restrukturierung von Anleihen nach dem neuen Schuldverschreibungsgesetz*. <https://doi.org/10.5771/9783845244792>
- Chatterjee, S., Dhillon, U. S., & Ramirez, G. G. (1995). Coercive tender and exchange offers in distressed high-yield debt restructurings: An empirical analysis. *Journal of Financial Economics*, 38(3), 333-360. [https://doi.org/10.1016/0304-405X\(94\)00815-1](https://doi.org/10.1016/0304-405X(94)00815-1)
- Coffee, J. C., & Klein, W. A. (1991). Bondholder coercion: The problem of constrained choice in debt tender offers and recapitalizations. *The University of Chicago Law Review*, 58(4), 1207-1273. <https://doi.org/10.2307/1599979>
- Danis, A. (2016). Do empty creditors matter? Evidence from distressed exchange offers. *Management Science*, 63(5), 1-17. <https://doi.org/10.1287/mnsc.2015.2375>
- Deutsche Bundesbank. (2019). *Vermögen und Finanzen privater Haushalte in Deutschland: Ergebnisse der Vermögensbefragung 2017*. Retrieved from <https://www.bundesbank.de/resource/blob/794130/d523cb34074622e1b4cfa729f12a1276/mL/2019-04-vermoegensbefragung-data.pdf>
- Feihle, P. C., & Lawrenz, J. (2017). The issuance of German SME bonds and its impact on operating performance. *Schmalenbach Business Review*, 18, 227-259. <https://doi.org/10.1007/s41464-017-0036-9>
- Franks, J. R., & Torous, W. N. (1994). A comparison of financial restructuring in distressed exchanges and chapter 11 reorganizations. *Journal of Financial Economics*, 35(3), 349-370. [https://doi.org/10.1016/0304-405X\(94\)90037-X](https://doi.org/10.1016/0304-405X(94)90037-X)
- Gertner, R., & Scharfstein, D. (1991). A theory of workouts and the effects of reorganization law. *Journal of Finance*, 46(4), 1189-1222. <https://doi.org/10.2307/2328856>
- Gilson, S. C., John, K., & Lang, L. H. P. (1990). Troubled debt restructuring: An empirical study of private reorganization of firms in default. *Journal of Financial Economics*, 27(2), 315-353. [https://doi.org/10.1016/0304-405X\(90\)90059-9](https://doi.org/10.1016/0304-405X(90)90059-9)
- Grinblatt, M., & Han, B. (2005). Prospect theory, mental accounting, and momentum. *Journal of Financial Economics*, 78(2), 311-339. <https://doi.org/10.1016/j.jfineco.2004.10.006>
- Herrmann, L. (2017). Mittelstandsanleihen und ihre privaten Investoren. *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung*, 69(3), 245-273. <https://doi.org/10.1007/s41471-016-0028-3>
- Herrmann, L., & Stolper, O. A. (2017). Investor familiarity and corporate debt financing conditions. *Finance Research Letters*, 23, 263-268. <https://doi.org/10.1016/j.frl.2017.08.004>
- Heß, D., & Ueber, M. P. (2013). *Misserfolg bei Platzierung: Börsennotierte Anleihen mittelständischer Unternehmen* [Disappointing bond placements: Publicly listed SME bonds in Germany]. <http://doi.org/10.2139/ssrn.2562316>

23. Jensen, M. C. (1989). Eclipse of the public corporation. *Harvard Business Review*, 67(5), 61–74. Retrieved from <https://hbr.org/1989/09/eclipse-of-the-public-corporation>
24. Jostarndt, P., & Sautner, Z. (2010). Out-of-court restructuring versus formal bankruptcy in a non-interventionist bankruptcy setting. *Review of Finance*, 14(4), 623–668. <https://doi.org/10.1093/rof/rfp022>
25. Kirchner, P. (2011). Abstimmung ohne Versammlung. In T. Preuße (Ed.), *SchVG Gesetz über Schuldverschreibungen aus Gesamtemissionen Kommentar* (Chapter 18, pp. 316–334). Berlin, Germany: Erich Schmidt Verlag.
26. Lürken, S., & Pickerill, C. (2011). Restrukturierung von High Yield Bonds nach Schuldverschreibungsgesetz und US-Recht. *Corporate Finance Law*, 7, 352–358.
27. Mann, S. V., & Powers, E. A. (2007). Determinants of bond tender premiums and the percentage tendered. *Journal of Banking and Finance*, 31(3), 547–566. <https://doi.org/10.1016/j.jbankfin.2005.12.008>
28. Mietzner, M., Proelss, J., & Schweizer, D. (2017). Hidden champions or black sheep? The role of underpricing in the German mini-bond market. *Small Business Economics*, 50(2), 375–395. <https://doi.org/10.1007/s11187-016-9833-7>
29. Nili, Y., & Kastiel, K. (2016). In search of “absent” shareholders: A new solution to retail investors’ apathy. *Delaware Journal of Corporate Law*, 41(1), 55–104. Retrieved from <https://ssrn.com/abstract=2870590>
30. ProxyPulse. (2018). *2018 proxy season review*. Retrieved from <https://www.broadridge.com/proxypulse/reports/2018/second-edition-2018.html>
31. Roe, M. J. (1987). The voting prohibition in bond workouts. *The Yale Law Journal*, 97(2), 232–279. <https://doi.org/10.2307/796482>
32. Schmidtbleicher, R. (2010). *Die Anleihegläubigermehrheit: Eine Institutionenökonomische, rechtsvergleichende und dogmatische Untersuchung*. <https://doi.org/10.1628/978-3-16-151485-2>
33. Schulenburg, F. G. (2017). *Der Schutz der Minderheit im Schuldverschreibungsrecht in vergleichender Betrachtung mit dem Aktienrecht* (Vol. 166). <https://doi.org/10.5771/9783845282800>
34. Vogel, H.-G. (2011). Beschlüsse der Gläubiger. In T. Preuße (Ed.), *SchVG Gesetz über Schuldverschreibungen aus Gesamtemissionen Kommentar* (pp. 111–125). Berlin, Germany: Erich Schmidt Verlag.
35. von Randow, P. (2017). Mittelstandsanleihen und Marktversagen. *Zeitschrift für Bankrecht und Bankwirtschaft*, 29(3), 158–170. <https://doi.org/10.15375/zbb-2017-0305>
36. Wang, W. (2011). Recovery and returns of distressed bonds in bankruptcy. *The Journal of Fixed Income*, 21(1), 21–31. <https://doi.org/10.3905/jfi.2011.21.1.021>
37. Wooldridge, J. M. (2016). *Introductory econometrics: A modern approach*. Boston, MA: Cengage Learning.

## APPENDIX

Table A.1. Approval rates and quorum requirements in bondholder meetings according to the German Bond Act of 2009

		First bondholder meeting				Second bondholder meeting			
		Approval rate requirements		Quorum requirements		Approval rate requirements		Quorum requirements	
SchVG 2009	Restructuring voting items (Sec. 5 (4) No. 2, Sec. 5 (3) No. 1-9)	“Qualified majority”	Sec. 5 (4) No. 2	“At least fifty per cent of the outstanding notes by value”	Sec. 15 (3) No. 1	“Qualified majority”	Sec. 5 (4) No. 2	“At least 25% of the outstanding notes for resolutions which require a qualified majority”	Sec. 15 (3) No. 4
	Other voting items	“Simple majority”	Sec. 5 (4) No. 1	“At least fifty per cent of the outstanding notes by value”	Sec. 15 (3) No. 1	“Simple majority”	Sec. 5 (4) No. 1	“Such second meeting requires no quorum”	Sec. 15 (3) No. 3
	Voting items in insolvency proceedings	“Majority resolution”	Sec. 19. (2) No. 1; Sec. 76 (2) No. 1 InsO	“No quorum requirements in insolvency. Provisions of insolvency law apply”	Sec. 19 (1), Sec. 76 (2) No. 1 InsO	n/a	n/a	n/a	n/a
Opt-in SchVG 2009	Transitional provisions (Sec. 24)	“Qualified majority”	Sec. 24 (2) No. 2	“At least fifty per cent of the outstanding notes by value”	Sec. 15 (3) No. 1	“Qualified majority”	Sec. 5 (4) No. 2	“For resolutions which require a qualified majority the persons present must represent at least 25 per cent of the outstanding notes”	Sec. 15 (3) No. 4

Table A.2. Variable descriptions and data sources

Variable name	Database/data source	Variable or calculation method
Total assets	WVD, Amadeus or annual reports	WVD: Total Assets Amadeus: Total Assets
ROA	WVD, Amadeus or annual reports	WVD: EBIT/Total Assets Amadeus: Operating results/Total Assets
Equity ratio (%)	WVD, Amadeus or annual reports	WVD: Book Value - Shareholders' Equity/Total Assets Amadeus: Equity/Total Assets
Issue size (EUR million)	Bond prospectus or Bloomberg	Actual bond issue volume
Time-to-maturity	Bond prospectus or Bloomberg	Fixed maturity of bond at issue date
Coupon	Bond prospectus or Bloomberg	Initial coupon at issue date
Second bondholder meeting (dummy)	Official bondholder meeting documents on bundesanzeiger.de	Dummy variable which is equal to one if the bondholder meeting was scheduled as a second bondholder meeting and zero otherwise
Restructuring of bond terms (dummy)	Official bondholder meeting documents on bundesanzeiger.de	Dummy variable which is equal to one if the bondholder meeting included voting items which materially amend bond terms with regards to loan duration, coupon size, principal amount etc. and zero otherwise
Participation rate (%)	Press releases, official bondholder meeting documents on bundesanzeiger.de, newsletters of SdK e.V. or DIU e.V.	Bond voting capital in attendance of a bondholder meeting
Bond holdings of retail investors	“Microdatabase: Securities Holdings Statistics” (SHS) database of Deutsche Bundesbank	Relative share of nominal bond capital held by households or retail investors at the time of a bondholder meeting
Quorum constitution (dummy)	Press releases, official bondholder meeting documents on bundesanzeiger.de	Dummy variable which is equal to one if the bondholder meeting constituted a quorum (50% participation rate in first meeting, 25% participation rate in second meeting)
Meeting success (dummy)	Press releases, official bondholder meeting documents on bundesanzeiger.de	Dummy variable which is equal to one if the bondholder meeting approved the (major) voting items on the agenda and zero otherwise
Sequence success (dummy)	Press releases, official bondholder meeting documents on bundesanzeiger.de	Dummy variable which is equal to one if the voting items were approved either in the first or in the in second meeting)

Notes: This table provides an overview of the variables and databases used. “Variable name” is the name used in all tables and figures, “Database/data source” shows which sources were used to obtain the information, “Variable or calculation method” is the name of the data item in the respective database or describes how the variable was derived or calculated.



**Table A.3.** Descriptive overview of approval rates in bondholder meetings

<b>Number</b>	37	<b>Mean</b>	94.9%
<b>Min</b>	50.3%	<b>Median</b>	98.6%
<b>Max</b>	100.0%	<b>25%-quintile</b>	92.1%
<b>Std. Dev.</b>	8.9%	<b>75%-quintile</b>	100.0%

Notes: This table provides a descriptive statistics of approval rates of 37 voting items, respectively. The coverage of approval rates in bondholder meetings is very limited, therefore this table only includes supplementary information outside of the main analyses.

**Table A.4.** Ordinary least square analysis of bondholder meeting participation rates — Robustness test Table 8

<b>Independent variables</b>	<b>Dependent variables: Bondholder meeting participation rate (%)</b>									
	<b>Panel A: Bondholder meetings 2010–2015</b>					<b>Panel B: Bondholder meetings 2016–2018</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>
Intercept	0.8621*** (0.1406)	0.7760*** (0.0882)	0.6493*** (0.0732)	0.6492*** (0.0723)	0.5702*** (0.0734)	0.9168*** (0.1036)	0.9879*** (0.0959)	0.8897*** (0.0883)	0.8792*** (0.0851)	0.6954*** (0.0887)
Bond holdings by retail investors (%)	-0.5337*** (0.1230)	-0.5170*** (0.1101)	-0.4166*** (0.1367)	-0.4167*** (0.1343)	-0.4077*** (0.1349)	-0.9080*** (0.1545)	-0.9228*** (0.1582)	-0.7396*** (0.1474)	-0.6913*** (0.1493)	-0.6957*** (0.1690)
Bond issue volume (log)	-0.0421* (0.0221)	-0.0340 (0.0290)	-0.0208 (0.0181)	-0.0208 (0.0178)		-0.0733** (0.0271)	-0.0697** (0.0263)	-0.0699*** (0.0230)	-0.0610** (0.0251)	
Second bondholder meeting (dummy)	0.0082 (0.0439)	-0.0017 (0.0434)	-0.0005 (0.0435)			0.0873* (0.0458)	0.0825* (0.0457)	0.0803* (0.0467)		
Equity ratio (%)	-0.2062* (0.1022)	-0.2476*** (0.0856)				0.2097* (0.1081)	0.2000* (0.1072)			
Return on assets (%)	-0.1594 (0.1604)	-0.0815 (0.1664)				0.3255 (0.2174)	0.3093 (0.2129)			
Restructuring of bond terms (dummy)	-0.0747 (0.1106)					0.0846 (0.0580)				
Year control dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Adj. R <sup>2</sup>	0.2878	0.2926	0.2491	0.2674	0.2603	0.5350	0.5215	0.4692	0.4377	0.3475
Number of obs.	44	44	44	44	44	36	36	36	36	36

Notes: This table reports the results from the OLS regression model for bondholder meeting participation rates. The dependent variable is the participation rate (in %) of the different bondholders meetings. The independent variables which are no dummy variables are winsorized on a 2.5% level on both sides. Huber-White-heteroscedasticity consistent standard errors are given in parentheses below the coefficients. Investigating the variance inflation factors (VIFs) reveals no multicollinearity, as the mean VIF is 1.72 and the maximum VIF is 4.67.

\*\*\*, \*\*, and \* indicate statistical significance of a 1%, 5%, and 10% level, respectively. Detailed definitions of fundamental characteristics are provided in Table A.2.

Table A.5. Probit model of quorum constitution in bondholder meetings — Robustness test Table 9

Independent variables	Dependent variables: Dummy variable for constituting a quorum									
	Panel A: Bondholder meetings 2010–2015					Panel B: Bondholder meetings 2016–2018				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	2.7049*** (0.7937)	1.6356*** (0.5479)	1.7038*** (0.4708)	1.6656*** (0.4670)	0.8764*** (0.3102)	-0.9388 (1.0607)	0.8414 (0.6967)	0.4807 (0.6688)	0.7027 (0.5696)	0.4179 (0.4311)
Bond holdings by retail investors (%)	1.0594 -2.4048*** (0.6567)	0.6416 -1.8710*** (0.6498)	0.6687 -1.8736*** (0.6479)	0.6546 -1.4157*** (0.5322)	0.3454 -1.3146** (0.5196)	-0.3741 -1.0775 (1.2892)	0.3354 -1.3385 (1.2442)	0.1917 -1.1671 (1.0989)	0.2803 -0.6177 (0.8844)	0.1667 -0.8835 (0.8543)
Bond issue volume (log)	-0.7723 -0.3116** (0.1341)	-0.7339 -0.2379** (0.1210)	-0.7353 -0.2867*** (0.1086)	-0.5564 -0.2222** (0.1061)	-0.5181	-0.2419 -0.2301 (0.1677)	-0.5336 -0.2301 (0.1569)	-0.4654 -0.1929 (0.1566)	-0.2464 -0.1439 (0.1516)	-0.3525
Second bondholder meeting (dummy)	1.5571*** (0.4034)	1.3771*** (0.3903)	1.3353*** (0.3845)			2.0675*** (0.4532)	1.7610*** (0.4046)	1.6436*** (0.4025)		
Equity ratio (%)	0.6099 0.0823 (1.1969)	0.5402 -0.1509 (1.1171)	0.5240			-1.3293 -1.3293 (1.0872)	-1.4104 -1.4104 (1.0182)			
Return on assets (%)	0.0322 0.2142 (1.2814)	-0.0592 0.8925 (1.1290)				-0.5297 3.2135* (1.8922)	-0.5622 2.8547 (1.8133)			
Restructuring of bond terms (dummy)	0.0839 -0.8403* (0.5013)	0.3501				1.2805 1.7745** (0.7197)	1.1379			
Year control dummies	-0.3291					0.7071				
McFadden R <sup>2</sup>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Observations with Dep = 0	0.2619	0.2359	0.2286	0.0845	0.0527	0.3620	0.2911	0.2624	0.0255	0.0135
Observations with Dep = 1	36	36	36	36	36	29	29	29	29	29
	45	45	45	45	45	29	29	29	29	29

Notes: This table reports the results from the Probit regression model of quorum maintaining in bondholder meetings. The dependent variable is a dummy variable which is equal to one if the bondholder meeting constitute a quorum and zero otherwise. The independent variables which are no dummy variables are winsorized on a 2.5% level on both sides. Hubert-White-heteroscedasticity consistent standard errors are shown in brackets below the coefficients and marginal effects are shown below standard errors in italics. Investigating the variance inflation factors (VIFs) reveals no multicollinearity, as the mean VIF is 1.21 and the maximum VIF is 1.64.

\*\*\*, \*\*, and \* indicate statistical significance of a 1%, 5%, and 10% level, respectively. Detailed definitions of fundamental characteristics are provided in Table A.2.

Table A.6. Probit model for successful restructuring sequence — Robustness test Table 10

Independent variables	Dependent variables: Dummy variable for successful restructuring sequence									
	Panel A: Sequences 2010–2015					Panel B: Sequences 2016–2018				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	1.6678**	1.8957***	1.9152***	1.9468***	1.5867***	-0.4785	1.2164	0.9523	1.0597	0.7984
	(0.8369)	(0.6436)	(0.5382)	(0.5711)	(0.3826)	(0.6540)	(0.1361)	(0.2454)	(0.2003)	(0.1388)
	0.4402	0.4997	0.5077	0.5137	0.4235	-0.1403	0.3706	0.2965	0.3303	0.2499
Bond holdings by retail investors (%)	-1.2721**	-1.4226**	-1.4047**	-1.3624**	-1.3351**	0.5150	0.0524	-0.1351	-0.0310	-0.2216
	(0.6477)	(0.5956)	(0.5737)	(0.5590)	(0.5887)	(0.7035)	(0.9669)	(0.8992)	(0.9762)	(0.8342)
	-0.3357	-0.3750	-0.3724	-0.3595	-0.3564	0.1510	0.0160	-0.0421	-0.0097	-0.0694
Bond issue volume (log)	-0.0758	-0.0922	-0.1239	-0.1069		-0.2106	-0.1971	-0.1125	-0.1210	
	(0.1813)	(0.1623)	(0.1448)	(0.1510)		(0.3129)	(0.2994)	(0.6017)	(0.5834)	
	-0.0200	-0.0243	-0.0328	-0.0282		-0.0618	-0.0601	-0.0350	-0.0377	
Second bondholder meeting (dummy)	0.2045	0.2698	0.2194			0.4433	0.3331	0.2135		
	(0.4683)	(0.4041)	(0.4214)			(0.3285)	(0.4752)	(0.6467)		
	0.0540	0.0711	0.0582			0.1300	0.1015	0.0665		
Equity ratio (%)	-0.2251	-0.1760				-1.5729	-1.9588			
	(1.9660)	(1.9158)				(0.2915)	(0.1867)			
	-0.0594	-0.0464				-0.4613	-0.5968			
Return on assets (%)	0.9261	0.7728				1.5619	1.2301			
	(1.7120)	(1.5561)				(0.5529)	(0.6127)			
	0.2444	0.2037				0.4581	0.3748			
Restructuring of bond terms (dummy)	0.1897					1.6804**				
	(0.5818)					(0.0220)				
	0.0501					0.4928				
Year control dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
McFadden R <sup>2</sup>	0.0886	0.0870	0.0807	0.0755	0.0658	0.1782	0.0466	0.0807	0.0112	0.0010
Observations with Dep = 0	11	11	11	11	11	9	9	9	9	9
Observations with Dep = 1	43	43	43	43	43	28	28	28	28	28

Notes: This table reports the results from the Probit regression model for successful restructuring sequences. The dependent variable is a dummy variable which is equal to one if the restructuring sequence is completed successfully and zero otherwise. Huber-White-heteroscedasticity consistent standard errors are shown in parentheses below the coefficients and marginal effects are shown below the standard errors in italics. Investigating the variance inflation factors (VIFs) reveals no multicollinearity, as the mean VIF is 1.60 and the maximum VIF is 2.67.

\*\*\*, \*\*, and \* indicate statistical significance of a 1%, 5%, and 10% level, respectively. Detailed definitions of fundamental characteristics are provided in Table A.2.