# Insider ownership, governance mechanisms, and corporate bond pricing around the world

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## ARTICLE INFO

## ABSTRACT

We investigate the effect of insider ownership on corporate bond yield spreads from 2003 to 2014 using a sample of 10,460 bonds issued by 1,222 non-financial firms from 44 countries. Using this sample, we find on average that greater insider ownership is associated with a higher yield spread. We consider consumption of private benefits as an economic channel through which insider ownership hurts bondholders. Using a global index of shareholder rights, we observe that the positive association between insider ownership and the spread decreases for firms with relatively stronger shareholder rights in which consumption of private benefits is less likely to occur. Furthermore, we report that in firms with more insider ownership the probability of related-party transactions is larger whereas their accounting return on assets is weaker, ceteris paribus. Taken together, the results indicate that bondholders anticipate that greater insider ownership facilitates consumption of private benefits, with implications for the valuation of corporate debt.

## 1. Introduction

A great deal of attention in the literature has been devoted to the diversity of ownership and corporate governance structures around the world and their consequences for the valuation of corporations. Many of these studies have investigated corporate ownership from a shareholder perspective. An important question to ask is whether ownership structures also play a role in the valuation of corporations' outstanding debt. This question is particularly relevant now that the bond market has become an even more prominent source of capital supply for companies in both developed and emerging markets. According to Tendulkar and Hancock (2014), the global corporate bond market has almost tripled since the early 2000s, and corporate bond financing – especially for the medium and long term - increased relative to other forms of financing.

In this study, we focus on bond pricing effects associated with corporate insiders. This is an ownership category that, despite its prominent presence in ownership structures around the world, has not received much attention in the international corporate bond literature to date. We define insider ownership as the percentage of shares that directors, managers, and other individuals involved in the management of a firm hold directly, through private companies or obtained by exer-

cising employee stock options. We study a pooled cross section of 10,460 bonds from 44 countries over the period from 2003 to 2014, issued by over 1,200 firms that vary in terms of insider ownership.

On the theoretical front, a prevailing view is that with greater levels of ownership, insiders' interests become more closely aligned with those of outside shareholders because insiders' pay-offs are more directly linked to stock market performance (Jensen and Meckling, 1976). This reasoning implies that insiders who are directly involved in management or able to exert managerial influence in other ways engage in less self-serving behavior when they have larger personal stakes at risk. Bondholders may rationally anticipate that they also benefit from this incentive-alignment effect, which suggests there is a negative relation between insider ownership and corporate bond spreads. However, on the empirical front, we provide evidence to suggest the contrary. Based on our sample, a first main result of the study is that yield spreads of corporate bonds tend to increase with higher levels of insider ownership, which is inconsistent with the incentive-alignment view. A one percentage-point increase in insider ownership is associated with an average 1.2 basis points increase in the yield spread, controlling for a host of fixed effects as well as firm- and issue-level variables.

The question why greater insider control would exacerbate debt agency costs is the subsequent focus of the study. We examine whether the consumption of private benefits is an economic channel of concern to bondholders that underlies the relation between insider ownership and spreads. We refer to this concern hereafter as the private-benefits channel. Specifically, insiders may enjoy greater control over the firm with an increase in ownership that could facilitate their consumption of private benefits (e.g., Fama, 1980; Fama and Jensen, 1983; Morck et al., 1988). Because the consumption of private benefits might diminish the value of corporate assets, bondholders may price-protect against the level of insider ownership. The exploration of this private-benefits channel proceeds as follows.

First, we expect that bondholders and non-insider shareholders have a common interest in stronger shareholder rights when insiders abuse corporate resources for personal benefit, and accordingly predict that the positive effect of insider ownership on the spread is mitigated by shareholder-rights provisions. To investigate this idea, we introduce an interaction effect between insider ownership and firm-level shareholder-rights provisions as measured by a global shareholder-rights index that we construct in a manner similar to Bebchuk et al. (2008). The results indicate that the positive effect of insider ownership on yield spreads is weaker in firms with stronger shareholder rights, which we consider consistent with the private-benefits channel.

Next, we delve deeper into the consumption of private benefits by studying a specific channel through which insiders could use their ownership to expropriate outsiders: tunneling. Tunneling is defined as the "transfer of assets and profits out of firms for the benefit of their controlling shareholders" (Johnson et al., 2000). Whereas some forms of tunneling, especially illegal ones such as theft and fraud, are hard to observe, other forms require disclosure. We focus on related-party transactions (RPTs), as disclosure rules on RPTs are nowadays widespread. While related-party transactions encompass regular business activities, some forms can be harmful to outside shareholders and creditors (Atanasov et al., 2011). Consistent with a private-benefits channel, we find that greater insider ownership is associated with a greater probability of RPTs, and that RPTs are also positively related to spreads. In addition, we estimate the relation between insider ownership and profitability and report that greater insider ownership is associated with a lower accounting return on assets.

Endogeneity and causality are common concerns in literature on the relation between ownership and firm value. We acknowledge that these problems are difficult to address and the literature to date provides no valid instrument for ownership variables (in the context of block ownership, see, e.g., Edmans and Holderness, 2016). To carefully explore potential endogeneity issues, we undertake additional tests on alternative explanations, and robustness.

This study makes several contributions. First, the study sheds new insights into the association between insider ownership and debt agency costs, providing evidence of a private-consumption channel. Specifically, the results add to Ortiz-Molina (2006), who hypothesizes that bondholders anticipate future risk-taking and risk-shifting incentives arising from higher managerial ownership. He reports that at-issue spreads on U.S corporate bonds were higher with greater top-management ownership and/or stock options, but less so at high ownership levels. Controlling for measures of risk, our global evidence on bond yields, related-party transactions and profitability suggests that, next to potential managerial risk-taking incentives, higher insider ownership could affect bondholder wealth through consumption of private benefits.

Second, the study adds a new perspective on the relevance of shareholder rights mechanisms for the bond market. Literature has suggested that the bond market deems shareholder rights mechanisms harmful to bondholder wealth due to conflicts of interests between shareholders and bondholders (e.g., Klock et al., 2005; Ashbaugh-Skaife et al., 2006). Empirical results in this study indicate that bondholders' consideration of shareholder rights is less straightforward: although shareholder rights mechanisms on their own could theoretically encourage management to take risks that benefits shareholders at the expense of bondholders, our results imply that bondholders deem shareholder rights mechanisms instrumental in reducing their risk of expropriation by powerful insiders. This moderating role of shareholder rights in the relation between insider ownership and bond spreads extends Cremers et al. (2007), who report that shareholder rights moderate the relation between concentrated institutional ownership and bond prices.

Furthermore, by linking insider ownership to spreads and related-party transactions (RPTs), this study not only contributes to the corporate bond literature but also extends studies that examine the effects of tunneling on firm value. Although RPTs are not "an evil by definition" (Pacces, 2011) and seldom prohibited, their potential abuse is an internationally widespread concern of policymakers. Empirical evidence suggests that the impact of RPTs on firm profitability and stock returns in specific Asian countries is negative, but bondholders' response to RPTs has not yet been documented. Anecdotal evidence from practice suggests that related party transactions matter for a company's creditworthiness. For example, in its

assessment of an equipment-manufacturing company, a leading credit-rating agency commented that "... ownership concentration may also result in a deterioration of its corporate governance standards, including an increase in risks related to excessive shareholder distributions, related-party transactions and prudent financial policy" (Moody's Investor Service, 2013).

Finally, the paper contributes to research that has concentrated on alternative types of ownership when studying corporate bonds, mainly based on U.S. issuers. Beyond literature on managerial ownership, Anderson et al. (2003) find that family ownership is negatively associated with the cost of debt of U.S. firms. Bhojraj and Sengupta (2003) document a negative relation between institutional ownership (as well as stronger control by outside directors) and at issue-spreads of U.S. bonds, but higher spreads in the presence of concentrated institutional ownership. Huang and Petkevich (2016) suggest that institutional ownership negatively relates to the yield spread provided that institutions are long-term oriented. Among the scarce body of evidence on bonds issued outside the United States, Ellul et al. (2009) report that family ownership exhibits a positive (negative) relation to the issue yield when country-level investor protection is relatively weak (strong). Borisova et al. (2015) report that government ownership causes higher spreads, but a lower spread in times of crisis or greater likelihood of financial distress.

## 2. Data description

### 2.1. Main dependent and independent variables

Our dataset on corporate bonds leans on a number of different data providers. Our initial universe of companies is defined by GMI Ratings, which provides corporate governance ratings and indicators for listed firms worldwide over the period from 2003 to 2014, including indicators about shareholder rights provisions and related-party transactions. For each firm in the GMI universe, we use Factset Research (Factset) to obtain all identifiers on debt securities outstanding in a given year[1]. The resulting bond-ISIN identifiers serve as inputs to Datastream and Factset for the collection of issue-level bond data. We drop index-inked, inflation-linked, floating and convertible bonds. In line with prior research, we exclude firms from the financial industry (Anderson, Mansi and Reeb, 2004; Klock et al., 2005; Cremers et al., 2007). Our main dependent variable is the yield spread on corporate bonds at the end of each calendar year provided by Datastream. The spread is defined as the difference between the bond's yield to maturity and that of a risk-free benchmark with matching currency and the closest maturity possible. Since the yield spreads are skewed by outliers, we trim the variable at the top and bottom 1%.

To determine how insider ownership relates to the yield spread, we obtain annual data on insider ownership for each bond issuer from Factset Ownership (also known as Factset/LionShares).[2] Factset contains international ownership information for equities with detailed insight into owner classifications. For instance, different types of insiders can be distinguished and the percentage of their ownership can be accessed separately. We define insider ownership as the percentage of shares that directors, managers, and other individuals involved in the management of a firm hold directly, through private companies or obtained by exercising employee stock options.

We introduce an annual shareholder-rights index for each firm in our dataset in order to investigate whether bondholders value insider ownership conditional on governance mechanisms that strengthen shareholder control. We construct the shareholder-rights index based on annual data on shareholder-rights limitations from Governance Metrics International (GMI). GMI (now part of MSCI) assesses small, mid and large cap companies' corporate governance based on macro data from academic, government and NGO datasets, company disclosures, and media reports (MSCI, 2016). The index we construct using a selection of GMI data is similar to the Entrenchment Index of Bebchuk et al. (2008) but is converted to a shareholder-rights measure in the spirit of Cremers et al. (2007).

A relevant issue is whether firms with different levels of insider ownership have fundamentally different characteristics that may also affect spreads, which would need to be taken into account. We consider as controls variables that drive spreads according to prior related empirical studies. Firm-level control variables taken from Datastream include the market value of equity, total debt-to-assets, profitability (*Return on Assets*), stock return volatility, and the dividend yield. As for issue level controls, we include a Moody's Rating from Factset and an indicator of investment-grade bonds (*Investment Grade Rating*). We consider a Split Rating dummy, which equals 1 whenever a Moody's rating differs from a S&P credit rating from Datastream, and Second Rating dummy that equals 1 whenever an issuer in our sample receives a rating from both Moody's and S&P. We transform the ordinal credit ratings from Moody's and S&P to numerical variables that range from 1 (D Rating) to 9 (AAA Rating). Other issue-specific controls are issue volume, measured by the logarithm of the amount issued in million U.S. dollars (*ln Amount Issued*), the remaining time to maturity from observation to redemption date (*Time to Maturity*), and a dummy that equals 1 if the bond is issued not only domestically both also elsewhere (*Globally Issued Bond*). We also use dummies to indicate whether a bond is senior (*Senior*) and secured (*Secured*), and dummies for identifying put (*Put Option*) and call (*Call Option*) features, similar to Cremers et al. (2007) and Boubakri and Ghouma (2010).

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[1] Using Datastream, bonds would have to be matched manually to issuing firms in order to achieve a panel dataset. However, Datastream appears to have the largest coverage of yield spread data. For this reason, in our study, Factset serves as an intermediate step in matching issue-specific data with firm-specific data.

[2] Factset data is available directly from Factset Research Systems, and indirectly via alternative platforms such as WRDS. We obtained ownership data directly from Factset.

We study whether insider ownership is associated with the risk of tunneling using GMI's records on companies' related party transactions (RPTs). Specifically, GMI indicates whether it has become public in given year that a firm has been involved in a RPT in the past two years. The transactions are defined as events involving executive and non-executive directors, managers, controlling shareholders, and relatives of any of these individuals. For modelling the probability of RPTs, we use from Datastream debt-assets and market value of equity as proxies of cash-flow restrictions and firm visibility, and both analyst coverage and the number of stock indexes the issuer is part of as proxies of firm opacity. We also collect the contract enforcement score from the World Bank Doing Business (World Bank, 2016) report as a proxy for the strength of legal frameworks. Appendix A1 summarizes the variables and their underlying sources.

*2.2. Summary statistics*

The sample covers 50,085 bond-year observations, which pertain to 10,460 corporate bonds from 1,222 non-financial firms.[3] The GMI universe is the most restrictive and limits our analysis in terms of firm-year observations and the timespan from 2002 to 2014.

Appendix A2 tabulates the geographic composition of the firms, bonds, and bond-years. A sizeable number of bonds in our global sample are from North American issuers (6472 bonds from 749 U.S. issuers and 504 bonds from Canadian issuers), consistent with studies on corporate bond market sizes (e.g., Tendulkar and Hancock, 2014). Moreover, the sample covers a large number of bonds from issuers across Europe and Asia. The geographic breakdown of the sample also illustrates that the vast majority of issuers are from more developed areas of the world.

Table 1 shows descriptive statistics for the full sample of corporate bonds. For our sample of corporate bonds issued around the world, we find a mean yield spread of 2.15%. Insider ownership is on average 3.43% in our sample, and in certain companies it reaches considerable magnitudes. The sample has a tilt towards financially healthy companies: the mean Moody's bond rating is 6.3, equivalent to a BBB rating, and the lowest observed rating is CCC. S&P ratings are less frequently acquired by issuing firms, and only 44.5% of the issuers in our sample obtain both ratings.

Table 2 presents mean values of firm and issue characteristics for, respectively, the subset of firms that experiences <10% insider ownership and the firms that have at least 10% insider ownership. Firms with at least 10% insider ownership have on average a smaller equity-market capitalization, a higher leverage ratio, a higher stock price volatility, and a lower dividend yield. Bond issues of firms with substantial insider ownership not only have, on average, a higher yield spread but also a lower Moody's rating, a somewhat shorter maturity, and slightly more often seniority and put option features. It is also interesting to see that these firms on average score somewhat higher on the shareholder rights index, and they have almost 0.8 percentage point lower profitability (return on assets) compared to firms with <10% insider ownership. Given these differences, we account for firm and bond covariates in our regressions.

## 3. Empirical analysis

*3.1. Insider ownership and corporate bond spreads*

We start with the relation between insider ownership and corporate bond yield spreads based on the entire sample. We estimate this relation by means of pooled ordinary least squares regressions with random effects:

$$\begin{aligned} Yield\,Spread_{ijt} &= \alpha_0 + \beta_1\,Insider\,Ownership_{jt} + \gamma_h Issue\,Controls_{ij(t)} + \delta_k Firm\,Controls_{jt} \\ &\quad + \theta_l Country_l + \upsilon_m Industry_m + \omega_p Currency_p + \varphi_t Year_t + \rho_i + \in_{ijt} \end{aligned} \tag{1}$$

where $i$ denotes an individual bond and $j$ stands for the issuing firm. *Insider Ownership* is the percentage of shares owned by directors, managers and other insiders directly or through private firms. *Issue Controls* is a set of $h = 1,\ldots, H$ time-varying issue-specific control variables and time-invariant bond features, and *Firm Controls* denotes $k = 1,\ldots,K$ issuer-level control variables. *Country*, *Industry*, *Currency*, and *Year* each represent a matrix of country, industry, currency, and year dummy indicators, where the indexes l = 1,…,L and m = 1,…,M (p = 1,…,P) are for notational convenience only as they are determined by $j$ ($i$). $\rho_i$ stands for the bond-specific random error term, $\in_{ijt}$ is the residual.

The firm-level control variables include firm size (ln *Market Value Equity*), *Leverage*, *Return on Assets*, stock return volatility (*Volatility*), and *Dividend Yield*. As for issue level controls, we include the *Moody's Rating* and the *Investment Grade Rating* dummy, which should both be negatively related to the spread. Because rating agencies are likely to assess firms using a variety of variables that also appear as separate controls in Eq. (1), the model alternatively includes an *Orthogonal Rating*. In addition, we include the *Split Rating* dummy because split ratings indicate rating uncertainty (Elton, 2004), and the *Second Rating* dummy as additional credit analyst coverage reduces information asymmetry (Hsueh and Kidwell, 1988). Other issue specific controls are the logarithm of the amount issued (ln *Amount Issued*), *Time to Maturity*, and the dummy *Globally Issued Bond*. We exclude convertible, inflation-, and index-linked bonds, and include dummies for *Senior* and *Secured* bonds as well as *Put Option* and *Call Option* features. In Table 3, the coefficient estimates on the controls largely match those of earlier stud-

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[3] Eleven bonds were dropped because the reported headquarter country code differed from other bonds of the same issuer. However, the results throughout the paper are very similar when these bonds are kept in the sample.

**Table 1**

Descriptive statistics of the full sample.

| Panel A: Firm characteristics | | | | | |
|---|---|---|---|---|---|
| | N | Mean | Std. Dev. | p25 | p75 |
| % Insider Ownership | 50,085 | 3.425 | 8.452 | 0.155 | 2.834 |
| Shareholder Rights Index | 50,085 | 3.162 | 1.333 | 2 | 4 |
| Market Capitalization | 50,085 | 33.178 | 47.278 | 5.819 | 37.94 |
| Leverage | 50,085 | 0.345 | 0.157 | 0.238 | 0.425 |
| Return on Assets | 50,085 | 5.894 | 5.778 | 3.46 | 8.3 |
| Volatility | 50,085 | 23.293 | 8.723 | 16.84 | 27.58 |
| Dividend Yield | 50,085 | 2.891 | 2.164 | 1.41 | 4.14 |
| Panel B: Bond characteristics | | | | | |
| | N | Mean | Std. Dev. | p25 | p75 |
| Spread | 50,085 | 2.146 | 2.166 | 0.864 | 2.611 |
| Moody's Rating (9) | 50,085 | 6.297 | 1.044 | 6 | 7 |
| S&P Rating (9) | 22,295 | 6.065 | 1.132 | 6 | 7 |
| Split Rating | 50,085 | 0.319 | 0.466 | 0 | 1 |
| Second Rating | 50,085 | 0.445 | 0.497 | 0 | 1 |
| Globally Issued Bond | 50,085 | 0.303 | 0.46 | 0 | 1 |
| Maturity (Years) | 50,085 | 15.038 | 11.49 | 8 | 20 |
| Amount Issued (Mio. USD) | 50,085 | 470.53 | 525.444 | 150 | 600 |
| Senior Bond | 50,085 | 0.7 | 0.458 | 0 | 1 |
| Secured Bond | 50,085 | 0.059 | 0.236 | 0 | 0 |
| Put Option | 50,085 | 0.02 | 0.141 | 0 | 0 |
| Call Option | 50,085 | 0.623 | 0.485 | 0 | 1 |

Table 1 shows descriptive statistics for our sample covering 10,460 corporate bonds issued by 1,222 nonfinancial firms in 44 countries from 2003 to 2014. The number of observations in this table refers to bond-years. We present complete variable descriptions in Appendix Table A1, the distribution of observations across countries in Appendix Table A2, and the scheme for transforming Moody's and S&P ratings to numerical ratings in A3.

**Table 2**

Descriptive statistics for insider and non-insider owned firms.

| N | | <10% | N | >10% | Difference | P-Value |
|---|---|---|---|---|---|---|
| Panel A: Firm characteristics | | | | | | |
| % Insider Ownership | 999 | 1.929 | 223 | 30.832 | −28.903 | 0.00 |
| Shareholder-Rights Index | 999 | 3.258 | 223 | 3.785 | −0.527 | 0.00 |
| Market Capitalization | 999 | 17.560 | 223 | 8.495 | 9.065 | 0.00 |
| Leverage | 999 | 0.337 | 223 | 0.383 | −0.047 | 0.00 |
| Return on Assets | 999 | 5.793 | 223 | 5.024 | 0.768 | 0.06 |
| Volatility | 999 | 28.110 | 223 | 33.120 | −5.010 | 0.00 |
| Dividend Yield | 999 | 2.143 | 223 | 1.773 | 0.370 | 0.01 |
| Panel B: Bond characteristics | | | | | | |
| Spread | 9,420 | 2.051 | 1,040 | 3.023 | −0.973 | 0.00 |
| Moody's Rating | 9,420 | 6.295 | 1,040 | 5.710 | 0.586 | 0.00 |
| S&P Rating (9) | 6,076 | 6.035 | 682 | 6.042 | −0.007 | 0.89 |
| Split Rating | 9,420 | 0.354 | 1,040 | 0.386 | −0.032 | 0.02 |
| Second Rating | 9,420 | 0.489 | 1,040 | 0.512 | −0.022 | 0.11 |
| Globally Issued Bond | 9,420 | 0.310 | 1,040 | 0.321 | −0.011 | 0.47 |
| Maturity (Years) | 9,420 | 12.908 | 1,040 | 10.253 | 2.656 | 0.00 |
| Amount Issued (Mio. USD) | 9,420 | 491.648 | 1,040 | 508.675 | −17.027 | 0.33 |
| Senior Bond | 9,420 | 0.713 | 1,040 | 0.751 | −0.038 | 0.01 |
| Secured Bond | 9,420 | 0.059 | 1,040 | 0.060 | −0.002 | 0.79 |
| Put Option | 9,420 | 0.012 | 1,040 | 0.005 | 0.007 | 0.05 |
| Call Option | 9,420 | 0.640 | 1,040 | 0.641 | −0.002 | 0.93 |

Table 2 shows descriptive statistics for our sample split into insider-owned and non-insider-owned issuing companies. The number of observations in this table refers to the number of firms (Panel A, firm characteristics) and number of bonds (Panel B, bond characteristics). We present complete variable descriptions in Appendix Table A1, the distribution of observations across countries in Table A2, and the scheme for transforming Moody's and S&P ratings to numerical ratings in Table A3.

ies: e.g., yield spreads are lower for firms that are larger in terms of market capitalization, more profitable in terms of ROA, and higher for bonds issued by firms that have greater financial leverage, a higher cash flow volatility, and a higher dividend yield. The observation that a longer time to maturity positively relates to the yield spread is also in line with prior studies (Borisova et al., 2015).

We now turn to the coefficient estimates for insider ownership. Table 3 presents the results of estimating Eq. (1) based on our full sample. To carefully address potential bad control issues, we augment the model of the spread step-by-step with

**Table 3**

Insider ownership and bond spreads.

| | (1)<br>Spread | (2)<br>Spread | (3)<br>Spread | (4)<br>Spread | (5)<br>Spread |
|---|---|---|---|---|---|
| % Insider Ownership | 0.040***<br>(0.007) | 0.012***<br>(0.004) | 0.012***<br>(0.004) | 0.009***<br>(0.003) | 0.012***<br>(0.003) |
| Moody's Rating (9) | | | | −0.456***<br>(0.060) | |
| Orthogonal Rating | | | | | −0.518***<br>(0.059) |
| Investment Grade Rating | | | | −1.466***<br>(0.266) | |
| Split Rating | | | | 0.158***<br>(0.025) | |
| Second Rating | | | | −0.160***<br>(0.024) | |
| Ln Market Value Equity | | −0.536***<br>(0.038) | −0.540***<br>(0.038) | −0.365***<br>(0.027) | −0.490***<br>(0.029) |
| Leverage | | 0.990***<br>(0.211) | 1.006***<br>(0.203) | 0.580***<br>(0.161) | 1.099***<br>(0.178) |
| ROA | | −0.049***<br>(0.007) | −0.048***<br>(0.007) | −0.045***<br>(0.007) | −0.052***<br>(0.007) |
| Volatility | | 0.081***<br>(0.005) | 0.082***<br>(0.005) | 0.059***<br>(0.007) | 0.088***<br>(0.005) |
| Dividend Yield | | 0.069***<br>(0.021) | 0.069***<br>(0.021) | 0.086***<br>(0.018) | 0.072***<br>(0.018) |
| Globally Issued Bond | | | −0.002<br>(0.031) | 0.000<br>(0.026) | −0.006<br>(0.027) |
| Time to Maturity | | | 0.015***<br>(0.002) | 0.018***<br>(0.002) | 0.016***<br>(0.002) |
| Ln Amount Issued | | | −0.003<br>(0.010) | −0.004<br>(0.009) | −0.002<br>(0.009) |
| Senior Bond | | | 0.009<br>(0.027) | 0.025<br>(0.024) | 0.006<br>(0.025) |
| Secured Bond | | | −0.068<br>(0.057) | −0.057<br>(0.044) | −0.075<br>(0.045) |
| Put Option | | | 0.097<br>(0.136) | 0.068<br>(0.119) | 0.101<br>(0.059) |
| Call Option | | | 0.063<br>(0.075) | -0.032<br>(0.058) | 0.039<br>(0.059) |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 50,085 | 50,085 | 50,085 | 50,085 | 50,085 |
| # Bonds | 10,460 | 10,460 | 10,460 | 10,460 | 10,460 |
| # Firms | 1222 | 1222 | 1222 | 1222 | 1222 |
| Overall $R^2$ | 0.353 | 0.616 | 0.622 | 0.670 | 0.662 |

We estimate models with the bond yield spread as dependent variable, and as independent variables insider ownership and control variables. Model (1) includes insider ownership while controlling for country, industry, currency, and year fixed effects. We then sequentially augment the model by including issuer controls in column (2), bond-specific controls in column (3), ratings in column (4) and orthogonal ratings in column (5). The spread is measured over the yield of a government benchmark with the same currency and the closest maturity available, from Datastream. *Insider Ownership* is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. The number of observations in this table refers to bond-years. Robust standard errors clustered at the firm level are shown in parentheses. Complete variable descriptions can be found in Table A1. *** p < 0.01, ** p < 0.05, * p < 0.1.

additional control variables. The first model, shown in column 1, includes country-, currency-, industry- and year-fixed effects next to insider ownership. Next, we add bond issuer- and issue-specific control variables in columns 2–5. Table 3 shows that across all variants of regression specification 1, larger insider ownership is associated with a higher yield spread. Column 1 of Table 3 shows that *Insider Ownership* has a coefficient that is economically largest in a model that includes as controls country-, industry-, currency-, and year-fixed effects ($\beta_1$ = 0.04, p < 0.01). Columns 2 and 3 indicate that the coefficient becomes economically smaller but continues to be statistically significant at the 1% level once we add firm-specific financials and issue-specific control variables ($\beta_1$ = 0.012, p < 0.01). Columns 4 and 5 point out that the relation between insider ownership and the yield spread remains positive under the most conservative specifications we estimate.

Whereas Table 3 provides full-sample estimates, we explore subsamples broken down by region, market, and legal origin in Table 4. Again, we add control variables step-by-step. Panel A shows coefficients on insider ownership obtained from models that include country-, industry-, currency-, and year-fixed effects. Overall, the table shows positive coefficients on insider ownership, which are statistically significant at the 5% level in the majority of the subsample specifications. Panel B reports the coefficients of models that additionally include issuer- and issue-specific controls as in the specification shown in column 4 of Table 3. Models based on regional subsamples with a relatively large number of issuers and bonds point to a positive coefficient on insider ownership, in the cases of North America, Europe, and developed markets. The subsamples

**Table 4**
Insider ownership and bond spreads – subsamples.

| Panel A | All | ex. USA | NA | Europe | AsiaPacific | Oceania | RoW | Developed | Emerging | Common | Civil |
|---|---|---|---|---|---|---|---|---|---|---|---|
| % Insider Ownership | 0.040*** | 0.024*** | 0.051*** | 0.036*** | 0.035*** | 0.123*** | 0.005 | 0.045*** | 0.015** | 0.050*** | 0.023*** |
| | (0.007) | (0.006) | (0.013) | (0.008) | (0.011) | (0.031) | (0.007) | (0.008) | (0.006) | (0.011) | (0.005) |
| Issuer/Bond/ Rating Controls | No | No | No | No | No | No | No | No | No | No | No |
| Countr/Curr/Ind/ Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Overall R2 | 0.353 | 0.421 | 0.327 | 0.433 | 0.372 | 0.437 | 0.586 | 0.348 | 0.504 | 0.335 | 0.442 |
| *Panel B* | All | ex. USA | NA | Europe | AsiaPacific | Oceania | RoW | Developed | Emerging | Common | Civil |
| % Insider Ownership | 0.009*** | 0.004 | 0.011** | 0.015*** | 0.011 | 0.070*** | −0.013*** | 0.011*** | −0.011** | 0.012*** | 0.002 |
| | (0.003) | (0.004) | (0.005) | (0.005) | (0.008) | (0.021) | (0.004) | (0.003) | (0.005) | (0.004) | (0.005) |
| Issuer/Bond/ Rating Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/ Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Overall R2 | 0.670 | 0.638 | 0.683 | 0.613 | 0.677 | 0.749 | 0.754 | 0.672 | 0.623 | 0.681 | 0.626 |
| Observations | 50,085 | 16,980 | 35,815 | 8,793 | 4,393 | 630 | 643 | 48,789 | 1,296 | 39,500 | 10,585 |
| Number of Bonds | 10,460 | 3,988 | 6,976 | 2,108 | 1,063 | 159 | 190 | 10,102 | 358 | 7,808 | 2,652 |
| Number of Firms | 1222 | 473 | 811 | 184 | 157 | 26 | 44 | 1125 | 97 | 948 | 274 |

We separate the global bond sample into various subsamples based on headquarter location and estimate models of the yield spread with insider ownership as main independent variable with country-, industry-, currency- and year-fixed effects in Panel A, and additionally with issue- and issuer-specific controls in Panel B (as in specification 4 of Table 3). The spread is measured relative to the yield of a government benchmark with the same currency and the closest maturity available, from Datastream. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. Subsample classifications are described in appendix A1. The number of observations in this table refers to bond-years. Robust standard errors clustered at the firm level are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

with much smaller issuer coverage yield heterogeneous results: for example, the coefficient on insider ownership is positive for Oceania (a small subset of the Asia-Pacific subsample), whereas it is negative for the emerging-markets subsample.

In addition, the last two columns in Panels A and B contrast countries' legal origins, using country classification from Djankov et al. (2008). As the literature finds that creditor rights are weaker in civil law countries (e.g., Djankov et al., 2008), we might expect that insider ownership is more heavily reflected in spreads when firms reside in countries with weaker creditor protection. However, it is interesting to see that the coefficient on insider ownership is significant for the common-law subsample across all panels, and in magnitude larger than the coefficient based on the civil-law subsample.

Taken together, the results of this section do not support the idea that bondholders associate greater ownership with stronger management commitment and incentive alignment. An alternative idea that we explore further in the next sections is that bondholders associate greater insider ownership with an increased likelihood that insiders extract private benefits.

### 3.2. Insider ownership, shareholder rights, and spreads

The results so far could suggest that bondholders tend to anticipate more consumption of private benefits when insiders have greater levels of share ownership in the spirit of Morck et al. (1988). In this section, we introduce a global index of firm-level shareholder-rights provisions as a moderator variable in the relation between insider ownership and the spread. Essentially, when insiders have sufficient power to consume corporate resources, not only bondholders but also shareholders face a threat of expropriation by insiders. It stands to reason that in such cases bondholders and shareholders have a common interest in shareholder-rights mechanisms that weaken the ability of insiders with greater ownership to extract private benefits at the expense of outsiders. For example, shareholder rights can directly help to control tunneling (Atanasov et al., 2011; Jung and Chung, 2016) and corporate governance might simultaneously moderate tunneling harmfulness (Wahab, Haron, Lok and Yahya, 2011).

We test this prediction by running regressions in which regression specification (1) is augmented with an interaction effect between insider ownership and a firm level shareholder rights measure. Models that are estimated take the form:

$$Yield\ Spread_{ijt} = \alpha_0 + \beta_1\ Insider\ Ownership_{jt} + \beta_2\ Insider\ Ownership * Shareholder - Rights\ Index_{jt}$$
$$+ \beta_3 Shareholder - Rights\ index_{jt} + \tag{2}$$
$$\gamma_h Issue\ Controls_{ij(t)} + \delta_k Firm\ Controls_{jt} + \theta_l Country_l + \upsilon_m Industry_m + \omega_p Currency_p + \varphi_t Year_t + \rho_i + \in_{ijt}$$

where $i$ denotes an individual bond and $j$ stands for the issuing firm. *Shareholder-Rights Index* represents a time-variant index at the firm-level $j$ and is determined by the existence or absence of five governance and anti-takeover provisions: the presence of (i) classified boards, (ii) poison pills, and (iii) golden parachutes, (iv) the limitation of the shareholder right to approve

bylaw amendments, and (v) the limitation of the right to approve charter amendments. Since fewer provisions imply more shareholder rights, we subtract one point for every mechanism in place from the maximum of five points. The components of the index are similar to those that jointly comprise the Entrenchment Index for U.S. firms developed by Bebchuk et al. (2008), but our global index based on GMI data is converted to an index that can be thought of as a shareholder-rights measure; more points on the index indicate fewer restrictions on shareholder rights, and thus comparably weaker management power.

The results in Table 5 point to a negative coefficient on the interaction between insider ownership and shareholder rights and a positive coefficient on insider ownership: the positive relation between insider ownership and the yield spread decreases with higher values of the shareholder-rights index[4]. In Panel A, which shows full-sample results, one percent additional insider ownership is associated with a spread increase of three basis points if shareholder rights are relatively weak (*Shareholder-Rights Index* = 0). In contrast, the estimated yield spread increase from insider ownership largely dissipates when shareholder rights stay fully unrestricted.

For robustness, we also report the coefficients of dummy variables that indicate specific threshold levels on insider ownership and we compare these with a hypothetical control group. Firms are assigned to a control group if the insider ownership percentage is smaller than 5%, and to *> 10% Insider Ownership* (*>20% Insider Ownership*) if insiders own at least 10% (20%) of the firm. To make a clear distinction between the levels of insider ownership in the control and treated group, we dropped firms with insider ownership levels between 5% and the higher thresholds. The coefficients on these dummy variables and their interaction with shareholder rights indicate that firms with larger levels of insider ownership have a higher spread but less so when the firm-level *Shareholder Rights index* increases. Panel B shows that the interaction effects documented in Panel A for the entire sample are also significant and qualitatively similar after issuers from the United States are excluded from the sample.[5]

Table 6 presents an alternative way to study the effect of insider ownership on the spread conditional on shareholder rights. Reported are coefficients on insider ownership variables *(Insider Ownership >* 10%*, Insider Ownership >* 20% *Insider Ownership)* that were estimated independently after breaking down the sample based on the yearly average level of the shareholder-rights index. According to Panel A of Table 6, the relation between insider ownership and the yield spread is in magnitude weaker among firms with above-average shareholder rights (columns 1 to 3) than among firms with weaker shareholder rights (columns 4 to 6). Panel B shows that the coefficients on the insider ownership variables are no longer significant for firms with more shareholder rights once U.S. firms drop out of the subsamples.

Hence, the shareholder-rights index negatively moderates the positive relation between insider ownership and corporate spreads, which we interpret as evidence consistent with the private-benefits view.

### 3.3. Insider ownership and tunneling

Finding that more shareholder rights negatively moderate the positive effect of insider ownership on bond spreads can be thought of as evidence that consumption of private benefits is an underlying channel of transmission from insider ownership to bond spreads. To provide more direct evidence on this economic channel, we turn to a corporate practice that the literature deems symptomatic of private consumption: tunneling. Tunneling can manifest itself in illegal activities such as "outright theft or fraud" (Johnson et al., 2000), but is not limited to this spectrum. One measurable way in which tunneling manifests itself are related-party transactions (Enriques and Volpin, 2007). IAS24 defines a related party transaction (RPT) as "a transfer of resources, services, or obligations between related parties, regardless of whether a price is charged"[6]. There is a widespread concern that insiders abuse RPTs even though, in theory, certain cases of such transactions can be economically beneficial (OECD, 2012).

GMI records whether there have been related party transactions "involving the CEO, company Chairman or other senior executive, a controlling shareholder, non-executive director or a relative of any of these individuals". We use these data points to estimate firm-level probit models with the indicator that *Related Party Transactions* by firm $i$ took place in year $t$ as dependent variable and where our *Insider Ownership* variable is expected to positively influence the probability of *Related Party Transactions*. Leverage and firm size are proxies for firms' tunneling capacity and visibility. Since RPTs are controversial and related studies suggests that they are detrimental to firm value, we expect firm size to negatively influence the probability of a related party transaction. We also control for firm opacity, by means of analyst coverage and the number of stock indexes that the firm is part of. We use the World Bank enforcing contracts score to control for differences in legal environ-

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[4] In non-reported regressions, we estimate separately models that include the Shareholder-Rights index without its interaction with insider ownership. The full-sample coefficient on the index is positive. Our international sample yields mixed effects, and the coefficients are statistically insignificant in several region-specific subsamples.

[5] One could also explore how the effect of insider ownership on spreads varies with country-level measures of shareholder protection against expropriation by insiders. However, a large portion of our sample is concentrated in few countries with high country-level shareholder rights. We estimated models of the spread based on samples with above-average and below-average values of Djankov et al.'s (2008) country-level shareholder-protection index ('anti-self-dealing index'). Across both subsamples, the coefficient on insider ownership is positive and similar in magnitude. In addition, we added the country-level anti-self-dealing index and its interaction with insider ownership to the model in which also our firm-level shareholder rights measure is interacted with insider ownership (excluding country dummies). Only the latter interaction effect is negative and significant, in line with base results in Table 5.

[6] E.g., see Deloitte (2017).

**Table 5**

Shareholder rights, insider ownership and bond spreads.

| | Panel A: Full sample | | | Panel B: Sample excluding USA | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Shareholder-Rights | 0.055*** | 0.047** | 0.043** | 0.088*** | 0.081** | 0.090*** |
| | (0.018) | (0.019) | (0.019) | (0.033) | (0.032) | (0.031) |
| % Insider Ownership | 0.030*** | | | 0.026** | | |
| | (0.007) | | | (0.010) | | |
| % Insider Own. × Shareholder Rights | −0.006*** | | | −0.005** | | |
| | (0.002) | | | (0.002) | | |
| >10% Insider Ownership | | 0.679*** | | | 0.760*** | |
| | | (0.179) | | | (0.254) | |
| >10% Insider Own. × Shareholder Rights | | −0.126*** | | | −0.180*** | |
| | | (0.045) | | | (0.054) | |
| >20% Insider Ownership | | | 1.033*** | | | 1.139** |
| | | | (0.298) | | | (0.462) |
| >20% Insider Own. × Shareholder Rights | | | −0.158** | | | −0.235** |
| | | | (0.066) | | | (0.095) |
| Issuer/Bond/Rating Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 50,085 | 45,692 | 43,279 | 16,980 | 15,309 | 14,165 |
| Number of Bonds | 10,460 | 10,001 | 9,487 | 3,988 | 3,774 | 3,516 |
| Number of Firms | 1222 | 1171 | 1101 | 473 | 449 | 429 |
| Overall $R^2$ | 0.671 | 0.669 | 0.661 | 0.639 | 0.647 | 0.641 |

Table 5 shows the interaction of insider ownership, shareholder rights, and their individual and mutual impact on spreads. The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, from Datastream. Insider ownership is defined as the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. In column 2 and 3, insider ownership is measured through a dummy indicating whether the percentage of insider ownership crosses the 10% and the 20% ownership threshold, respectively. Governance is measured by means of the Shareholder-Rights Index, constructed similar to Bebchuk et al. (2008) and based on data from GMI Ratings. A higher index indicates that a company has adopted fewer shareholder rights limitations. The index comprises six dimensions and thus varies from 0 to 5, with a high index hence indicating more shareholder-friendly governance. All models include the complete set of control variables as outlined in Table 3, column 4. Robust standard errors clustered at firm level are depicted in parentheses, the number of observations in this table refers to bond years. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

ments that might influence the probability of whether related party transactions have to be consistently reported, which in turn can also have a disciplining effect on tunneling.

Table 7 shows the marginal effects that arise from estimating probit models with *Related Party Transactions* as the dependent variable. The estimated marginal effects in Panel A point out that the percentage of insider ownership is positively related to the occurrence of an RPT, even after controlling for other plausible determinants of tunneling likelihood. A one-percent increase in insider ownership is associated with a 0.6 percent increase in the probability that an RPT is recorded by GMI ($p < 0.01$). This positive effect is largely consistent across different levels of insider ownership, as illustrated by the similarity of the marginal effects estimated at the sample means and the average marginal effect across the sample. In addition, the marginal effect associated with *Insider Ownership* remains positive when firms located from the U.S. are excluded from the sample, as shown in Panel B.

These effects support the idea that the consumption of private benefits is more likely to occur in firms with more insider ownership. Since legal liability associated with abusive RPTs is either weak or difficult to enforce (OECD, 2012), investors may weigh the effects of connected-party transactions in the pricing of corporate bonds. If the bond market values consumption of private benefits ex ante, then we could expect that our RPT variable positively influences the yield spread (to the extent an observed related party transaction influences bond investors' ex ante expectation of consumption of private benefits). In Table 8, we formally introduce *Related Party Transactions* as determinant of the spread in variants of regression specification (1), where we replace insider ownership by *RPT*. Column 1 in Panel A reports the full-sample regression result, columns 2 and 3 pertain to samples of BBB- and BB-rated bonds, respectively.

The *Related Party Transactions* variable is significantly positively associated with the yield spread for firms rated BBB or less according to Panel A (Full Sample) and Panel B (Ex. USA), and the coefficient on *Related Party Transactions* increases in magnitude as the sample is reduced to bonds with relatively greater credit risk. When GMI records that a company has engaged in an RPT in the past two years, the spread is estimated to rise by 10.4 bp (16.8 bp) based on a sample of below BBB (BB) bonds. For non-U.S. bonds rated below BB, the spread is estimated to be 53 bp higher when a related-party transaction is recorded.

In Table 9, we include *Related Party Transactions* alongside insider ownership in models of the yield spread, and we run regressions using the full sample as well as subsamples broken down by rating class from Panel A of Table 8. In addition, we explore models in which *Insider Ownership* is replaced by the dummy variables that mark 10% and 20% ownership threshold levels. The coefficients on insider ownership variables remain positive in the presence of RPTs, which is no longer significant in the presence of insider ownership when models are estimated for firms with BB or less. While insider ownership seems to

**Table 6**

Shareholder rights, insider ownership and bond spreads.

| Panel A: Full sample | | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Unrestricted Shareholder Rights | | | Restricted Shareholder Rights | | |
| % Insider Ownership | 0.006 | | | 0.016*** | | |
| | (0.004) | | | (0.004) | | |
| >10% Insider Ownership | | 0.178* | | | 0.359*** | |
| | | (0.099) | | | (0.125) | |
| >20% Insider Ownership | | | 0.322** | | | 0.633*** |
| | | | (0.161) | | | (0.208) |
| Observations | 24,705 | 22,573 | 21,163 | 25,380 | 23,119 | 22,116 |
| Number of Bonds | 7,532 | 7,163 | 6,777 | 7,385 | 7,049 | 6,724 |
| Overall $R^2$ | 0.686 | 0.687 | 0.677 | 0.666 | 0.662 | 0.659 |
| Panel B: Sample excl. USA | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Unrestricted Shareholder Rights | | | Restricted Shareholder Rights | | |
| % Insider Ownership | −0.000 | | | 0.017*** | | |
| | (0.005) | | | (0.005) | | |
| >10% Insider Ownership | | −0.097 | | | 0.413*** | |
| | | (0.124) | | | (0.142) | |
| >20% Insider Ownership | | | 0.032 | | | 0.633*** |
| | | | (0.167) | | | (0.223) |
| Observations | 10,787 | 9,511 | 8,660 | 6,193 | 5,798 | 5,505 |
| Number of Bonds | 3,530 | 3,318 | 3,088 | 2,045 | 1,967 | 1,851 |
| Overall $R^2$ | 0.652 | 0.663 | 0.654 | 0.662 | 0.657 | 0.661 |

The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, from Datastream. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. The shareholder-rights index is constructed similar to Bebchuk et al. (2008) and Cremers et al. (2007), and based on global data from GMI Ratings. A higher index indicates that a company has adopted fewer shareholder-rights limitations. The index comprises six dimensions and thus varies from 0 to 5, with a high index hence indicating more shareholder-friendly governance. In columns 1 to 3, issuers with a Shareholder-Rights Index above the yearly sample-mean index are included in the regressions, in columns 4–6 results pertain to issuers with an index value below the mean. Include are the complete set of control variables as outlined in Table 3, column 4. Robust standard errors clustered at firm level are in parentheses; Observations refers to bond years. *** p < 0.01, ** p < 0.05, * p < 0.1.

marginally subsume the relation between RPTs and bond spreads, we acknowledge that related party transactions represent just one of several alternative practices that can help insiders' extract private benefits. An interesting avenue for future research would be to study bondholders' response to a wider range of practices that are symptomatic of tunneling, and how these relate to insider ownership.

### 3.4. Insider ownership and return on assets

If greater insider ownership facilitates the consumption of private benefits, one could expect that firms with greater insider ownership report a lower profitability, to the extent that practices such as tunneling are eventually manifested in profitability ratios of financial statements. In this section, we study the relation between insider ownership and profitability as measured by accounting return on assets (*ROA*) and provided by Datastream. Table 10 reports the results of including different sets of control variables. In columns 1 and 2 of Table 10, we show the estimates of the effect of insider ownership on ROA using the full and the non-U.S. sample, while controlling for country-, industry, and time-fixed effects. Under these two specifications, insider ownership negatively relates to *ROA*. Next, following Eichholtz et al. (2012), we include the natural logarithm of total assets (ln(*Total Assets)*) and the *Price-to-Book* ratio. Columns 3 and 4 indicate that the signs and magnitudes of the coefficients on insider ownership remain consistent with expectations. Moreover, we add the indicator of related party transactions to the regression models and find that the full sample coefficient on *Related Party Transactions* is negative and significant, controlling for industry, country and year fixed effects, and for asset size and the book-to-market ratio.

### 3.5. Endogeneity and alternative explanations

We acknowledge the endogeneity of insider ownership (e.g., Demsetz and Villalonga, 2001) and the possibility that insiders change their ownership in response to financial performance, instead of financial performance being exogenously affected by insider ownership. To date, no valid instrument to cleanly identify causal effects from block-ownership has been put forward (Edmans and Holderness, 2016). However, we provide several considerations of these concerns.

**Table 7**
Insider ownership and related-party transactions.

| *Panel A: Full sample* | | | | |
|---|---|---|---|---|
| | Marginal effect at the mean | | Average marginal effect | |
| | (1) | (2) | (3) | (4) |
| % Insider Ownership | 0.006*** | 0.006*** | 0.006*** | 0.007*** |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Ln Market Value Equity | | −0.006 | | −0.006 |
| | | (0.010) | | (0.011) |
| Leverage | | 0.001 | | 0.001 |
| | | (0.001) | | (0.001) |
| # Analysts | | 0.001 | | 0.001 |
| | | (0.002) | | (0.002) |
| # Local Index Inclusions | | −0.004 | | −0.004 |
| | | (0.016) | | (0.018) |
| WB Enforcing Contracts | | −0.028*** | | −0.031*** |
| | | (0.007) | | (0.008) |
| Countr/Ind/Year FE | Yes | Yes | Yes | Yes |
| Observations | 8,723 | 7,924 | 8,723 | 7,924 |
| *Panel B: Sample excl. USA* | | | | |
| | Marginal effect at the mean | | Average marginal effect | |
| | (1) | (2) | (3) | (4) |
| % Insider Ownership | 0.003*** | 0.004*** | 0.004*** | 0.004*** |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Ln Market Value Equity | | 0.010 | | 0.012 |
| | | (0.013) | | (0.015) |
| Leverage | | 0.002* | | 0.002* |
| | | (0.001) | | (0.001) |
| # Analysts | | 0.001 | | 0.001 |
| | | (0.002) | | (0.003) |
| # Local Index Inclusions | | −0.009 | | −0.010 |
| | | (0.019) | | (0.021) |
| WB Enforcing Contracts | | −0.013 | | −0.014 |
| | | (0.009) | | (0.010) |
| Countr/Ind/Year FE | Yes | Yes | Yes | Yes |
| Observations | 2,889 | 2,585 | 2,889 | 2,585 |

Table 7 shows the impact of insider ownership on the probability of related party transactions (RPTs) involving directors, managers, major shareholders or family members. The dependent variable is an indicator whether related party transactions that have happened in the past two years have become public and reported by GMI Ratings. Insider ownership is defined as the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. Column 1 and 2 show the marginal effect at the sample means as estimated by probit regressions, columns 3 and 4 show the average marginal effects. Robust standard errors clustered at firm level are depicted in parentheses, the number of observations in this table refers to firm years. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

One alternative story could be that insiders buy shares of their companies in order to strengthen the financial position of the firm once these experience weaker financial conditions and higher yield spreads. Even though this alternative explanation is theoretically counterintuitive because our sample is tilted towards financially healthy issuers, we investigate whether the positive association between insider ownership and the spread disappears once firms with ownership changes are dropped from the sample. Panel A of Table 11 reports the effect of insider ownership on yield spreads using the global sample as well different regional samples after dropping all bonds from firms with changes of>1% in insider ownership. Compared to results reported in Panel B of Table 4, the positive coefficients on *Insider Ownership* derived from North American and European subsamples double in magnitude, whereas the full-sample coefficient is largely similar and the negative loading on insider ownership from the emerging-markets subsample loses statistical significance.

To further test whether the observed effect could be driven by insider repurchases in response to financial performance deterioration, we exclude from the sample firms that experienced a bond rating downgrade between 2003 and 2014 before re-estimating regression specification 1. This exclusion largely reduces the sample, since downgrades often occur during the financial crisis. Panel B of Table 11 shows that the coefficient on *Insider Ownership* remains positive and significant under this sample restriction. Compared to Panel B of Table 4, the coefficients on insider ownership remain similar in most cases, although the coefficient has gained statistical significance (at the 10%, 5% and 1% levels) for the Asia-Pacific subsample while it is not significant based on the European subsample.

Furthermore, in Table 12 we shed light on lagged effects, by using one-year or two-year lagged values of *Insider Ownership* as the independent variable in regression specification (1), instead of contemporaneous ownership. According to Panel A of Table 12, one-year lagged insider ownership positively relates to the bond spread based on the full-sample estimate of model (1), and also subsample results are largely similar to those reported in Table 4. When insider ownership is lagged by two years, the coefficients keep their signs but – except for the European sample - their significances fall below conventional sig-

**Table 8**
Related-party transactions and bond spreads.

| Panel A: Full sample | | | |
|---|---|---|---|
| | (1) All | (2) <=BBB Rating | (3) <=BB Rating |
| Related Party Transactions | 0.052 | 0.104** | 0.168* |
| | (0.038) | (0.051) | (0.097) |
| Issuer/Bond/Rating Controls | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes |
| Observations | 50,085 | 27,759 | 8,280 |
| Number of Bonds | 10,460 | 6,506 | 2,411 |
| Overall $R^2$ | 0.669 | 0.694 | 0.644 |
| Panel B: Ex. United States | | | |
| | (1) All | (2) <=BBB Rating | (3) <=BB Rating |
| Related Party Transactions | −0.103 | 0.188* | 0.532*** |
| | (0.092) | (0.100) | (0.172) |
| Issuer/Bond/Rating Controls | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes |
| Observations | 14,270 | 5,917 | 1,323 |
| Number of Bonds | 3,484 | 1,731 | 479 |
| Overall $R^2$ | 0.626 | 0.626 | 0.726 |

The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, retrieved from Datastream. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. Column 1 shows the impact of related party transactions for the full sample, columns 2 and 3 show the coefficients estimated based on a sample including bonds with, respectively, a BBB rating and lower and BB rating and lower. Panel A includes all issuers, Panel B only issuers with non-U.S. headquarters. Robust standard errors clustered at firm level are in parentheses; the number of observations in this table refers to bond years. *** p < 0.01, ** p < 0.05, * p < 0.1.

**Table 9**
Insider ownership, related-party transactions and bond spreads.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | Full Sample | | | =<BBB Rating | | | <=BB Rating | | |
| % Insider Ownership | 0.009*** | | | 0.007*** | | | 0.011*** | | |
| | (0.003) | | | (0.003) | | | (0.004) | | |
| >10% Insider Ownership | | 0.243*** | | | 0.228** | | | 0.293** | |
| | | (0.084) | | | (0.091) | | | (0.130) | |
| >20% Insider Ownership | | | 0.432*** | | | 0.309** | | | 0.603*** |
| | | | (0.153) | | | (0.133) | | | (0.193) |
| Related Party Transactions | 0.043 | 0.037 | 0.041 | 0.092* | 0.068 | 0.069 | 0.142 | 0.133 | 0.179* |
| | (0.037) | (0.038) | (0.038) | (0.050) | (0.051) | (0.052) | (0.093) | (0.094) | (0.100) |
| Issuer/Bond/Rating Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 50,085 | 45,692 | 43,279 | 27,759 | 25,254 | 23,812 | 8,280 | 7,301 | 6,463 |
| Number of Bonds | 10,460 | 10,001 | 9,487 | 6,506 | 6,225 | 5,903 | 2,411 | 2,245 | 2,054 |
| Overall $R^2$ | 0.670 | 0.668 | 0.661 | 0.695 | 0.698 | 0.694 | 0.646 | 0.653 | 0.639 |

The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, retrieved from Datastream. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. Columns 1–3 show the impact of insider ownership variables for the full sample, columns 4–6 (7–9) show the coefficients estimated based on a sample including bonds with a BBB (BB) rating and lower. Robust standard errors clustered at firm level are depicted in parentheses, the number of observations in this table refers to bond years. *** p < 0.01, ** p < 0.05, * p < 0.1.

nificance levels. Finding one-year lagged effects alleviates the concern of an alternative explanation, i.e., that insiders who enjoy superior information might buy shares as the firm financing conditions deteriorate in anticipation of a subsequent recovery.

Another explanation for the main results is that increased insider ownership incentivizes managers to undertake more risky investments that benefit shareholders at the expense of bondholders (Shleifer and Vishny, 1997; Ortiz-Molina, 2006). Ortiz-Molina (2006) suggests that spreads reflect an expression of bondholders' concerns about the risk-shifting

**Table 10**

Insider ownership and accounting return on assets.

| | (1)\nFull Sample | (2)\nExcl. USA | (3)\nFull Sample | (4)\nExcl. USA | (5)\nFull Sample | (6)\nExcl. USA | (7)\nFull Sample | (8)\nExcl. USA |
|---|---|---|---|---|---|---|---|---|
| Insider Ownership | −0.031** | −0.031*** | −0.026** | −0.033*** | −0.029** | −0.031*** | −0.024** | −0.033*** |
| | (0.012) | (0.010) | (0.012) | (0.011) | (0.012) | (0.010) | (0.012) | (0.011) |
| Related Party Transactions | | | | | −0.534** | 0.263 | −0.555*** | 0.259 |
| | | | | | (0.213) | (0.300) | (0.214) | (0.298) |
| Ln(Total Assets) | | | 0.157 | −0.324 | | | 0.165 | −0.328 |
| | | | (0.141) | (0.332) | | | (0.141) | (0.332) |
| Price-to-Book | | | 0.104*** | 0.168*** | | | 0.104*** | 0.168*** |
| | | | (0.024) | (0.054) | | | (0.024) | (0.054) |
| Country/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 8,810 | 2,976 | 8,712 | 2,915 | 8,810 | 2,976 | 8,712 | 2,915 |
| Number of Firms | 1,221 | 472 | 1,205 | 462 | 1,221 | 472 | 1,205 | 462 |
| Overall $R^2$ | 0.0807 | 0.168 | 0.102 | 0.200 | 0.0824 | 0.169 | 0.104 | 0.201 |

The dependent variable is the firm's annual accounting return on assets, from Datastream. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. The controls include country, industry and year fixed effects in Columns 1 2,5 and 6, and additionally the natural logarithm of total assets in US dollars and the winsorized price-to-book ratio (at 0.5th and 99.5th percentiles) in columns 3, 4, 7 and 8. Models 5 to 8 also include the indicator of related party transactions. All models are estimated with random effects. Robust standard errors clustered at firm level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

**Table 11**

Insider ownership and bond spreads: additional tests.

*Panel A: Sample excl. bonds from issuers with changes in insider ownership > |+/- 1%|*

| | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
|---|---|---|---|---|---|---|---|---|---|---|
| % Insider Ownership | 0.014*** | 0.006 | 0.021*** | 0.012*** | 0.008 | −0.023* | 0.017*** | −0.008 | 0.018*** | 0.006 |
| | (0.004) | (0.004) | (0.007) | (0.004) | (0.011) | (0.012) | (0.005) | (0.005) | (0.006) | (0.005) |
| Issuer/Bond Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 37,693 | 11,774 | 28,300 | 6,067 | 2,859 | 266 | 37,123 | 570 | 30,884 | 6,809 |
| Number of Bonds | 7,807 | 2,807 | 5,429 | 1,518 | 702 | 95 | 7,623 | 184 | 6,031 | 1,776 |
| Within $R^2$ | 0.619 | 0.534 | 0.665 | 0.487 | 0.685 | 0.613 | 0.622 | 0.466 | 0.659 | 0.513 |
| Between $R^2$ | 0.702 | 0.732 | 0.687 | 0.714 | 0.718 | 0.787 | 0.691 | 0.830 | 0.689 | 0.745 |
| Overall $R^2$q | 0.656 | 0.639 | 0.667 | 0.624 | 0.699 | 0.731 | 0.653 | 0.720 | 0.666 | 0.643 |

*Panel B: Sample excl. bonds from issuers with one or more rating downgrades*

| | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
|---|---|---|---|---|---|---|---|---|---|---|
| % Insider Ownership | 0.010*** | 0.006 | 0.014*** | 0.014 | 0.015** | −0.011*** | 0.013*** | −0.006* | 0.014*** | 0.003 |
| | (0.003) | (0.004) | (0.005) | (0.010) | (0.006) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Issuer/Bond Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 27,393 | 8,880 | 20,169 | 4,140 | 2,232 | 581 | 26,429 | 964 | 22,418 | 4,975 |
| Number of Bonds | 6,096 | 2,277 | 4,141 | 1,100 | 598 | 173 | 5,814 | 282 | 4,689 | 1,407 |
| Within $R^2$ | 0.618 | 0.518 | 0.658 | 0.485 | 0.441 | 0.573 | 0.625 | 0.464 | 0.649 | 0.343 |
| Between $R^2$ | 0.755 | 0.759 | 0.754 | 0.636 | 0.780 | 0.862 | 0.751 | 0.776 | 0.751 | 0.783 |
| Overall $R^2$ | 0.689 | 0.683 | 0.695 | 0.608 | 0.703 | 0.756 | 0.688 | 0.681 | 0.692 | 0.688 |

Table 11 shows the impact of insider ownership on bond spreads for different regional or country groups as indicated by the column headers. The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, retrieved from Datastream. Insider ownership is defined as the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. All regressions include the complete set of control variables as outlined in Table 3, column 4. Robust standard errors clustered at firm level are depicted in parentheses, the number of observations in this table refers to bond years. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

potential that comes with management incentives to behave in the interest of shareholders. However, several observations in this study indicate that insiders' risk-taking incentive cannot entirely account for the observed effect. First, our results prevail after controlling for measures of risk such as the level of stock price volatility, which prior studies have used to link insiders' shareholdings and equity incentives to risk taking (e.g., Wright et al., 1996). Second, shareholder rights provisions may also align the risk preferences of insiders and outside shareholders to the detriment of bondholder wealth (Klock et al., 2005; Ashbaugh-Skaife et al., 2006; Cremers et al., 2007). Therefore, when bondholders value insider ownership due to concerns about risk taking, we would expect that shareholder-rights provisions do not weaken (and possibly even strengthen) the positive relation between insider ownership and the spread. Instead, the results point to a negative interaction effect consistent with the private-benefits channel. Third, Wright et al. (1996), Wright, Kroll, Krug and Pettus (2007), and Ortiz-Molina (2006) hypothesize that managers with high levels of ownership are relatively more concerned about idiosyncratic

**Table 12**

Insider ownership and bond spreads – lagged ownership.

*Panel A: 1-year Lag*

| | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
|---|---|---|---|---|---|---|---|---|---|---|
| % Insider Ownership | 0.007** | 0.003 | 0.010* | 0.014** | 0.005 | −0.010* | 0.009** | −0.015** | 0.011** | −0.001 |
| | (0.003) | (0.004) | (0.005) | (0.006) | (0.011) | (0.006) | (0.004) | (0.008) | (0.005) | (0.007) |
| Issuer/Bond Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 39,625 | 12,992 | 28,839 | 6,687 | 3,330 | 453 | 38,687 | 938 | 31,692 | 7,933 |
| Number of Bonds | 9,276 | 3,542 | 6,180 | 1,896 | 951 | 139 | 8,982 | 294 | 6,920 | 2,356 |
| Within $R^2$ | 0.600 | 0.485 | 0.646 | 0.471 | 0.567 | 0.554 | 0.602 | 0.569 | 0.639 | 0.442 |
| Between $R^2$ | 0.716 | 0.701 | 0.715 | 0.674 | 0.733 | 0.789 | 0.719 | 0.624 | 0.719 | 0.681 |
| Overall $R^2$ | 0.666 | 0.624 | 0.681 | 0.607 | 0.677 | 0.735 | 0.668 | 0.610 | 0.680 | 0.606 |

*Panel B: 2-year lag*

| | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
|---|---|---|---|---|---|---|---|---|---|---|
| % Insider Ownership | 0.005 | 0.001 | 0.006 | 0.014*** | 0.014 | −0.009 | 0.006 | −0.009 | 0.007 | −0.002 |
| | (0.004) | (0.005) | (0.006) | (0.005) | (0.014) | (0.008) | (0.004) | (0.010) | (0.005) | (0.007) |
| Issuer / Bond Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 30,349 | 9,450 | 22,659 | 4,793 | 2,379 | 314 | 29,705 | 644 | 24,772 | 5,577 |
| Number of Bonds | 7,858 | 2,899 | 5,347 | 1,537 | 778 | 116 | 7,632 | 226 | 5,952 | 1,906 |
| Within $R^2$ | 0.601 | 0.480 | 0.645 | 0.505 | 0.502 | 0.582 | 0.603 | 0.549 | 0.639 | 0.421 |
| Between $R^2$ | 0.679 | 0.644 | 0.686 | 0.612 | 0.735 | 0.786 | 0.681 | 0.656 | 0.691 | 0.613 |
| Overall $R^2$ | 0.658 | 0.607 | 0.673 | 0.605 | 0.679 | 0.742 | 0.659 | 0.620 | 0.672 | 0.584 |

Table 12 shows the impact of insider ownership on bond spreads for different regional or country groups as indicated by the column headers. The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, retrieved from Datastream. Insider ownership is defined as the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. All regressions include the complete set of control variables as outlined in Table 3, column 4. Robust standard errors clustered at firm level are shown in parentheses; the number of observations in this table refers to bond-years. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

risk. Hence, we would expect incentives to take risk to decrease with higher levels of ownership. Table A4 in the Appendix reports estimated average spread levels for different levels of insider ownership based on the full sample. On the contrary, we find that higher levels of insider ownership are associated with higher spreads.[7] Taken together, we interpret these results as evidence that the yield spread increase associated with greater insider ownership occurs for reasons beyond risk shifting.

### 3.6. Additional tests

In addition to ruling out alternative interpretations of the relation between insider ownership and corporate bond spreads, we conduct several additional robustness tests. To begin with, we verify that our results are not affected by other ownership characteristics. First, some studies suggest that the wedge between ownership and control (voting rights) drives related-party transactions and self-dealing (Enriques and Volpin, 2007), while other studies such as Aslan and Kumar (2012) and Lin, Ma, Malatesta and Xuan (2011) find that a greater wedge is positively associated with bank loan rates. Since consumption of private benefits may harm firm value, insiders with fewer cash flow-rights (ownership) relative to voting rights (control) theoretically have more incentives to expropriate wealth. Given that ownership and voting rights tend to be highly correlated, the question arises whether the percentage of shares held by insiders is associated positively with spreads only because it is a proxy for the control-ownership wedge[8]. Since studies on U.S. firms such as Gompers, Ishii and Metrick (2011) suggests that insider ownership in terms of cash flow rights could lead to higher firm value after controlling for voting rights, it is possible that for firms with no control-ownership wedge more insider ownership provides relatively greater incentive-alignment rather than incentives to consume private benefits. If so, we could expect the coefficient on *Insider Ownership* to decrease or become negative in samples composed of these firms. Although we do not measure cash flow rights and voting rights directly, we do present evidence along two lines suggesting that our main results are not driven by the wedge. Specifically, we have access to information about deviations from a one-share-one vote policy, which is also known to exacerbate the control-ownership wedge. The GMI database contains information about whether common or ordinary equity shares have "one-share, one-vote, with no restrictions". Table 13 indicates that insider ownership positively relates to the spread also after excluding firms without a one-share-one-vote policy as identified by GMI. The global and regional results remain largely in line

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[7] As in section 3.2, to make a clear distinction between the levels of insider ownership in the control and treated groups, we dropped firms with insider ownership levels between 5% and the higher thresholds.

[8] We acknowledge however that mechanisms other than deviation from one share-one-vote could elevate the percentage of votes that insiders enjoy, which could be positively correlated with the percentage of shares held. For example, using Swedish data, Cronqvist and Nilsson (2003) report regressions that yield a negative relation between controlling owner vote ownership and Tobin's q, but no relation between firm value and deviation from one-share-one-vote. They refer to potential multicollinearity problems regarding their vote ownership and equity ownership variables.

**Table 13**

Insider ownership and the yield spread: one-share-one-vote policy.

|  | All | Ex. USA | NA | Europe | AsiaPacific | RoW | Developed | Emerging | Common | Civil |
|---|---|---|---|---|---|---|---|---|---|---|
| % Insider Ownership | 0.009*** | 0.005 | 0.011** | 0.013** | 0.014*** | −0.014*** | 0.011*** | −0.010** | 0.012*** | 0.004 |
|  | (0.003) | (0.003) | (0.005) | (0.005) | (0.005) | (0.005) | (0.004) | (0.004) | (0.004) | (0.004) |
| Issuer/Bond/Rating Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 43,540 | 12,735 | 33,135 | 7,495 | 1,927 | 558 | 42,361 | 1,179 | 36,795 | 6,745 |
| Number of Bonds | 9,114 | 3,005 | 6,532 | 1,809 | 477 | 179 | 8,779 | 335 | 7,358 | 1,756 |
| # Firms | 1096 | 391 | 759 | 162 | 111 | 42 | 1005 | 91 | 896 | 200 |
| Overall $R^2$ | 0.669 | 0.649 | 0.678 | 0.618 | 0.713 | 0.741 | 0.670 | 0.619 | 0.677 | 0.645 |

After removing firms without a one-share-one vote policy according to GMI, we estimate models with the yield spread as dependent variable, and as independent variables insider ownership along with firm-specific control variables, bond characteristics, credit ratings, country fixed effects, industry fixed effects, currency fixed effects and year fixed effects in Table 13 (see Eq. (1)). The bond spread is measured over the yield of a government benchmark with the same currency and the closest maturity available, retrieved from Datastream. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. All regressions include the complete set of control variables as outlined in Table 3, column 4. The number of observations in this table refers to bond-years. Robust standard errors clustered at the firm level are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

with those in Table 4. In addition, we observe a significantly positive effect for the subsample of bonds issued by firms in Asia-Pacific once we exclude firms without one-share one-vote policies. Next, in tests we do not report for the sake of brevity, we identify using Datastream firms with cross-ownership, which is known to cause a wedge between ownership and control. After excluding firms with cross-ownership, the coefficients stay similar in magnitude and significance for the entire sample and larger subsamples, even though the significance level is sometimes affected by this exclusion. Taken together, the additional results up to this point suggest that insider ownership positively relates to bonds spreads even after excluding firms in which consumption of private benefits is theoretically more likely to occur because of disproportionate voting rights in the hands of certain owners.[9]

Second, apart from considering the control-ownership wedge, we also consider potentially confounding roles of other types of ownership. We exclude firms with government ownership stakes, because government ownership matters for bond pricing according to earlier empirical evidence on yields of publicly traded debt (Borisova et al., 2015). Reducing these firms yields results similar to Table 4. Third, our results are similar after adding control variables such as the percentage of shares owned by institutions and dummy variables that indicate institutional blocks to our regression specification (see, e.g, Bhojraj and Sengupta, 2003; Cremers et al., 2007).[10]

Third, we make use of alternative estimators and collapse the data to firm-level observations in order to address two potential concerns. First, throughout the paper, regression specification 1 is estimated using random effects, although unobservable firm or bond characteristics might be correlated with the error terms. The other potential concern is that bond observations from the same issuer are correlated. Four additional full-sample and subsample tests are reported in Table 14 to address these concerns. We first convert yearly spread observations at the bond level to observations at the firm level, by taking a weighted average of bond spreads that a firm has outstanding. In separate random-effects regressions, a firm-level spread-year is computed as either an equal-weighted average across outstanding bonds (Panel A) or a weighted average based on bond issue size (Panel B). The effect of insider ownership on yield spreads is equal in sign as well as magnitude and significant for the full sample as well as various larger subsamples. Finally, we further reduce these annual equal- and value-weighted yield spread observations to one observation per firm, i.e., the firm-level annual yields are averaged across time, because spreads may exhibit limited time variation. This collapse reduces sample size dramatically, and creates very small samples for specific regions. For the larger global samples as well as the North American subsample, the results in Panels C and D point to positive coefficients on insider ownership that are significant below 1% or 5% levels of significance.

## 4. Conclusion

Based on 10,460 corporate bonds publicly issued by 1,222 firms in 44 countries over the period from 2003 to 2014, we study the impact of insider ownership and governance mechanisms on bonds' yield spreads. First, we report that insider ownership is on average positively related to bond spreads. We consider consumption of private benefits as an economic channel through which insider ownership hurts bondholders.

In line with our expectations, the positive association between insider ownership and the yield spread is weaker in firms where consumption of private benefits is less likely to occur due to stronger rights of shareholders. Related party transactions, which are known to provide private benefits, are more likely to occur in firms with more insider ownership. Further-

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[9] While these results are different from studies that link the control-ownership wedge to bank loan spreads, we note that Cheung et al. (2006) find no relation between the likelihood of related-party transactions and the ownership-control wedge in their Hong Kong sample.

[10] Results are available on request.

**Table 14**

Insider ownership and firm-level bond spreads.

| Panel A: Random effects, using firm-level yield spreads based on issue equal-weighted bond yields | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Full Sample | Ex USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
| % Insider Ownership | 0.010*** | 0.005 | 0.014*** | 0.002 | 0.009 | −0.009 | 0.012*** | −0.002 | 0.013*** | 0.004 |
| | (0.003) | (0.003) | (0.004) | (0.006) | (0.007) | (0.006) | (0.003) | (0.005) | (0.004) | (0.004) |
| Observations | 8,815 | 2,981 | 6,266 | 1,399 | 803 | 231 | 8,332 | 483 | 7,074 | 1,741 |
| # Firms | 1,222 | 473 | 811 | 183 | 157 | 44 | 1,125 | 97 | 948 | 274 |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Within $R^2$ | 0.637 | 0.545 | 0.684 | 0.572 | 0.437 | 0.719 | 0.640 | 0.597 | 0.658 | 0.510 |
| Between $R^2$ | 0.811 | 0.787 | 0.833 | 0.735 | 0.796 | 0.794 | 0.820 | 0.740 | 0.816 | 0.795 |
| Overall $R^2$ | 0.736 | 0.696 | 0.759 | 0.639 | 0.700 | 0.761 | 0.740 | 0.678 | 0.745 | 0.687 |

| Panel B: Random effects, using firm-level yield spreads based on issue size-weighted bond yields | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
| % Insider Ownership | 0.011*** | 0.005 | 0.015*** | 0.003 | 0.009 | −0.008 | 0.013*** | −0.003 | 0.014*** | 0.003 |
| | (0.003) | (0.003) | (0.004) | (0.007) | (0.007) | (0.006) | (0.003) | (0.005) | (0.004) | (0.004) |
| Observations | 8,829 | 2,995 | 6,269 | 1,409 | 804 | 231 | 8,346 | 483 | 7,074 | 1,744 |
| # Firms | 1,222 | 474 | 812 | 184 | 158 | 44 | 1,126 | 97 | 948 | 274 |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Within $R^2$ | 0.626 | 0.533 | 0.675 | 0.556 | 0.437 | 0.708 | 0.629 | 0.584 | 0.658 | 0.510 |
| Between $R^2$ | 0.811 | 0.792 | 0.836 | 0.726 | 0.790 | 0.751 | 0.819 | 0.749 | 0.816 | 0.795 |
| Overall $R^2$ | 0.730 | 0.692 | 0.756 | 0.627 | 0.693 | 0.701 | 0.735 | 0.670 | 0.745 | 0.687 |

| Panel C: Firm-level spread; yields are equal-weighted average across bond and time; OLS estimator | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variables | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
| % Insider Ownership | 0.008** | −0.001 | 0.016*** | −0.020* | 0.015* | 0.028 | 0.011*** | 0.001 | 0.013*** | −0.000 |
| | (0.003) | (0.004) | (0.005) | (0.012) | (0.009) | (0.018) | (0.004) | (0.011) | (0.004) | (0.006) |
| Observations | 1,221 | 472 | 811 | 182 | 157 | 44 | 1,124 | 97 | 948 | 273 |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.806 | 0.819 | 0.818 | 0.811 | 0.872 | 0.958 | 0.811 | 0.858 | 0.803 | 0.834 |

| Panel D: Firm-level spread; yearly average yields are issue size-weighted across bonds; OLS estimator | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variables | Full Sample | Ex. USA | NA | Europe | AsiaPacific | ROW | Developed | Emerging | Common | Civil |
| % Insider Ownership | 0.015*** | 0.002 | 0.025*** | −0.015 | 0.005 | −0.011 | 0.019*** | −0.003 | 0.020*** | 0.002 |
| | (0.005) | (0.005) | (0.007) | (0.010) | (0.009) | (0.016) | (0.006) | (0.010) | (0.006) | (0.006) |
| Observations | 1,221 | 472 | 811 | 182 | 157 | 44 | 1,124 | 97 | 948 | 273 |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.767 | 0.766 | 0.801 | 0.774 | 0.835 | 0.948 | 0.770 | 0.847 | 0.788 | 0.784 |

Table 14 shows the impact of insider ownership on bond spreads for different regional or country groups as indicated by the column headers. The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available. Insider ownership is the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. All models include the complete set of control variables as outlined in Table 3, column 4. Panel A and B show the coefficients, estimated using random effects with robust standard errors, when bond observations for each firm are equal-weighted and issue size-weighted, respectively. Panel C and D show OLS estimations, with standard errors clustered at firm level, when yearly firm-level observations are further averaged over time to obtain one observation per firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

more, insider ownership was found to be associated with lower accounting return on assets. We conclude that bondholders anticipate that greater insider ownership facilitates consumption of private benefits.

The bond market's pricing of insider ownership has implications for disclosure practice and corporate governance policy. Mechanisms to tackle expropriation by insiders have been a long-standing concern among policymakers (OECD, 2012), and have developed further in recent years. However, consumption of private benefits would not necessarily constitute an expropriation problem if bondholders anticipate the amount consumed and adjust their willingness to pay for corporate bonds accordingly. On the other hand, it might be questionable whether the penalties paid by insider owners through their cash flow rights for engaging in RPTs is tightly enough connected to their true value (Atanasov et al., 2011). More regulatory efforts to improve regulation, disclosure quality, board effectiveness and shareholder rights might be needed to effectively control self-dealing of powerful insiders, which in turn raises the empirical question how these efforts affect bondholders' valuation of insider ownership.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgements

## Appendix

See Tables A1–A4.

**Table A1**
Variables.

| Name | Description | Source |
|---|---|---|
| **Dependent Variable** | | |
| Spread | Yield spread in percent as provided by Datastream. Defined as the annualized yield to maturity of the corporate bond over the yield to maturity of a government security of the respective currency and closest time to maturity available. | Datastream |
| **Ownership** | | |
| % Insider Ownership | Sum of the percentage of shares obtained through employee stock options, shares held by individual corporate insiders and private companies. | FactSet |
| > x % Insider Ownership | Dummy indicating whether the percentage of insider ownership calculates as indicated above exceeds x %. In order to cleanly separate firms with and without insider ownership, observations of bonds issued by firms with less than five percent are labelled 0, others are excluded in this definition. | FactSet |
| % Institutional Ownership | Percentage of shares held by institutional owners and investment banks. | Datastream |
| % Government Ownership | Percentage of shares held by the government or a government institution. | Datastream |
| % Cross ownership | Percentage of shares held by one company in another. | Datastream |
| **Corporate Governance** | | |
| Shareholder-Rights Index | Governance Index constructed largely in line with Bebchuk et al. (2008). GMI provides information on five out of the six original dimensions, comprising the existence of a poison pill, golden parachutes, limitation of the shareholder right to prevent charter amendments, limitation of the shareholder right to prevent bylaw amendments and the existence of a classified board. For the existence of every provision one point is deducted from six, the maximum of the governance index. | GMI |
| Related Party Transactions | Dummy indicating whether there have been related party transactions "involving the CEO, company Chairman or other senior executive, a controlling shareholder, non-executive director or a relative of any of these individuals". | GMI |
| One-Share One-Vote | Dummy indicating whether the firm deviated from a one-share one-vote policy. | GMI |
| Multiple Share Classes | Dummy indicating whether the firm currently has multiple share classes outstanding. | Datastream |
| **Legal Environment** | | |
| Enforcing Contracts Score | The enforcing contracts indicator measures the time and cost for resolving a commercial dispute through a local first-instance court, and the quality of judicial processes index, evaluating whether each economy has adopted a series of good practices that promote quality and efficiency in the court system (World Bank, 2016) The score thereby ranging from 0 (weak contract enforcement) to 100 (strong contract enforcement). | World Bank |
| **Rating Variables** | | |
| Moody's Rating | Moody's security level rating, converted into nine rating categories. | FactSet |
| Moody's Rating (Orthogonal) | Residuals from a regression of Moody's security level ratings on the remaining control variables including market value, leverage, return on assets, stock volatility, dividend yield, maturity, amount issued, seniority, securitization, bond features, year, industry, country and bond currency dummies. | FactSet |
| Moody's Investment Grade | Dummy indicating whether a bond is considered to possess investment grade quality. The threshold for investment grade bonds is set at B. Corporate bonds rated triple CCC or worse are considered below investment grade. | FactSet |
| S&P Rating | S&P security level rating, converted into nine rating categories. | Datastream |
| Split Rating | Dummy indicating whether Moody's and S&P ratings are known not to be in accordance. | |
| Second Rating | Dummy indicating whether the firm acquired ratings from both Moody's and S&P. | |
| **Issue Controls** | | |
| Globally Issued Bond | Dummy indicating whether a bond is issued globally, meaning that is traded both on the local and on an international trading platform. | Datastream |
| Senior | Dummy indicating whether a bond is considered senior. | Datastream |
| Secured | Dummy indicating whether a bond is secured. | Datastream |
| Ln(Amount Issued) | Natural logarithm of the amount of the bond issue in million U.S. dollar. | Datastream |

**Table A1** (*continued*)

| Name | Description | Source |
|---|---|---|
| Time to Maturity | Remaining time to maturity calculated from the year end of the observation year to the redemption date. | Datastream |
| Put Option | Dummy indicating whether a bond can be put early by the holder. Information obtained from Datastream is supplemented by FactSet. Comprised in the control for bond features. | DS&FactSet |
| Call Option | Dummy indicating whether a bond can be called early by the issuer. Information obtained from Datastream is supplemented by FactSet. Comprised in the control for bond features. | DS&FactSet |
| **Issuer Controls** | | |
| Ln Market Value Equity | Natural logarithm of the market capitalization, expressed in million U.S. dollar. | Datastream |
| Leverage | Total debt divided by total assets (%). | Datastream |
| Return on Assets | Return on assets (%). | Datastream |
| Dividend Yield | Dividend yield (%). | Datastream |
| Volatility | Stock's average annual price movement (%) to a high and low from a mean price for each year. Defined in the Datastream Worldscope module as follow: "A stock's price volatility of 20% indicates that the stock's annual high and low price has shown a historical variation of +20% to -20% from its annual average price." | Worldscope |
| Analysts | Number of analysts following the firm. | Datastream |
| Index Coverage | Number of stock indexes covering the firm. | Datastream |
| **Fixed Effects** | | |
| Currency FE | Dummies generated according to 3-digit currency codes as defined by the International Standards Organization. | Datastream |
| Country FE | Dummies generated according to 3-digit country codes as defined by the International Standards Organization. | Datastream |
| Industry FE | Dummies generated using the first digit of the Standard Industry Classification codes. | Datastream |
| Year FE | Dummies indicating the observation year. | Datastream |
| **Regional classifications** | | |
| NA | North America (USA & Canada) | FactSet |
| Europe | Includes issuers with headquarters in Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Italy, Luxemburg, the Netherlands, Norway, Portugal, Spain, Sweden and Switzerland. | FactSet |
| Asia-Pacific | Includes issuers with headquarters in Hong Kong, Indonesia, India, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand, and Oceania. | FactSet |
| Oceania | Australia and New Zealand. | FactSet |
| Rest of the World (ROW) | Includes issuers with headquarters in Brazil, Chile, Egypt, Israel, Mexico, South Africa. | FactSet |
| Developed | Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Luxemburg, Netherlands, New Zealand, Norway, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, United Kingdom and the United States of America. | FTSE Classification |
| Emerging | Includes issuers with headquarters in Brazil, Chile, China, Czech Republic, Colombia, Egypt, Greece, India, Indonesia, Malaysia, Mexico, the Philippines, Poland, Peru, Russia, South Africa, Taiwan, Thailand, Turkey. | FTSE Classification |
| Civil Law | As classified in Djankov, La Porta, Lopez-diSilanes and Shleifer (2006), this subset includes issuers with headquarters in civil law countries. | Djankov et al. (2006) |
| Common Law | As classified in Djankov, La Porta, Lopez-diSilanes and Shleifer (2006), this subset includes issuers with headquarters in common law countries. | Djankov et al. (2006) |

**Table A2**
Geographical distribution of firms and bonds.

| Country ISO | # Firms | #Bonds | Country ISO | # Firms | #Bonds |
|---|---|---|---|---|---|
| USA | 749 | 6472 | IDN | 5 | 8 |
| AUT | 5 | 28 | IRL | 4 | 17 |
| AUS | 25 | 158 | ISR | 4 | 14 |
| BEL | 6 | 57 | IND | 11 | 29 |
| HKG | 32 | 134 | JPN | 49 | 650 |
| BRA | 16 | 71 | KOR | 14 | 39 |
| CAN | 62 | 504 | LUX | 1 | 10 |
| CHE | 9 | 121 | MEX | 11 | 65 |
| CHL | 6 | 22 | MYS | 7 | 14 |
| CHN | 2 | 2 | NOR | 4 | 42 |
| COL | 1 | 6 | NZL | 1 | 1 |
| CZE | 1 | 19 | PER | 1 | 1 |
| DEU | 28 | 433 | PHL | 1 | 2 |
| DNK | 3 | 19 | POL | 6 | 11 |
| EGY | 1 | 2 | PRT | 3 | 29 |
| ESP | 12 | 126 | RUS | 11 | 66 |
| FIN | 7 | 36 | SWE | 7 | 87 |
| FRA | 26 | 421 | SGP | 4 | 13 |
| ITA | 12 | 160 | THA | 5 | 12 |
| GBR | 44 | 440 | TUR | 4 | 5 |
| NLD | 14 | 91 | TWN | 1 | 1 |
| GRC | 1 | 6 | ZAF | 6 | 16 |
| **Total** | | | | **1222** | **10,460** |

**Table A3**
Rating conversion scheme rating conversion from text to numerical.

| Conversion | S&P debt rating | Grade |
|---|---|---|
| 9 | AAA | Investment |
| 8 | AA+ | Investment |
| 8 | AA | Investment |
| 8 | AA- | Investment |
| 7 | A+ | Investment |
| 7 | A | Investment |
| 7 | A- | Investment |
| 6 | BBB+ | Investment |
| 6 | BBB | Investment |
| 6 | BBB- | Investment |
| 5 | BB+ | Speculative |
| 5 | BB | Speculative |
| 5 | BB- | Speculative |
| 4 | B+ | Speculative |
| 4 | B | Speculative |
| 4 | B- | Speculative |
| 3 | CCC+ | Speculative |
| 3 | CCC | Speculative |
| 3 | CCC- | Speculative |
| 2 | CC | Speculative |
| 1 | C | Speculative |
| 1 | D | Speculative |

**Table A4**
Insider ownership thresholds and bond yield spreads.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| >10% Insider Ownership | 0.246*** | | | | |
| | (0.084) | | | | |
| >15% Insider Ownership | | 0.277*** | | | |
| | | (0.106) | | | |
| >20% Insider Ownership | | | 0.439*** | | |
| | | | (0.152) | | |
| >25% Insider Ownership | | | | 0.572*** | |
| | | | | (0.179) | |
| >50% Insider Ownership | | | | | 0.641** |
| | | | | | (0.260) |
| Observations | 45,749 | 43,941 | 43,333 | 43,027 | 41,948 |
| Number of Bonds | 10,012 | 9,644 | 9,498 | 9,438 | 9,161 |
| Issuer/Bond/Rating Controls | Yes | Yes | Yes | Yes | Yes |
| Countr/Curr/Ind/Year FE | Yes | Yes | Yes | Yes | Yes |
| # Bond Years | 45,749 | 43,941 | 43,333 | 43,027 | 41,948 |
| # Bonds | 1171 | 1131 | 1101 | 1082 | 1013 |
| Overall R2 | 0.667 | 0.662 | 0.660 | 0.658 | 0.655 |

Table A4 shows the impact of insider ownership on bond spreads when separating the sample into treatment (bonds issued by firms with insider ownership) and control (bonds issued by firms without insider ownership). The dependent variable is the spread of corporate bonds over the yield of a government benchmark with the same currency and the closest maturity available, retrieved from Datastream. Insider ownership is defined as the percentage of shares held by individual insiders such as directors, managers and family members directly, obtained through employee stock options or held through private companies based on information provided by FactSet. All regressions include the complete set of control variables as outlined in Table 3, column 4. Observations are considered as part of the treated sample if the respective issuers passed a certain threshold of insider ownership as indicated on the left. The number of observations refers to bond years. Robust standard errors clustered at firm level are depicted in parentheses, complete variable descriptions can be found in Appendix I.1. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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