Investor Demand for Corporate Bonds: Role of Analysts

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Abstract

In this study, we examine the impact of analyst activity on investor demand for bonds. Using comprehensive data on orderbook size in the primary market of corporate bonds, we provide robust evidence that higher analyst coverage and higher forecast accuracy have a positive impact on the investor demand, whereas forecast dispersion has a negative impact. We also find that the impact is more pronounced if the bond has a less informative issuance procedure, such as non-green bonds, as well as the bond issuers have higher information asymmetry and low ESG performance. This evidence suggests that bond investors' demands overcome the information asymmetry associated with bond issuers using analysts' activity. Overall, our results are consistent with the bright side view and imply that analyst activity is a critical determinant of investor demand for corporate bonds.

Keywords: Investor demand, analyst activity, bond subscription, corporate bond market, information asymmetry

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1. Introduction

Great investor demand is an essential prerequisite not only for firms to access external finance but also for investors to diversify their portfolio. A high level of oversubscription in the orderbook for new bonds can provide firms with a stronger bargaining position in terms of setting the final terms of an offering (Miller and Puthenpurackal, 2002; Cornelli and Goldreich, 2003; Derrien, 2005). Existing literature also demonstrates that higher investor demand for corporate bonds lowers the cost of capital, which increases the value of firms, and shortens the timing of the next issuance, which also improves the strength of firms' access to capital, hence, issuers are concerned about attracting sufficient demand for their offerings (Derrien, 2005; Krebbers *et al.*, 2023). Likewise for investors, the attraction of new bond issuance is higher due to the diversification benefits, as it allows investors to actively adjust their portfolio and hence would demand new bond issuance by a company (Asquith *et al.*, 2013).

Existing literature argues that bond issuance has comparatively lower information asymmetry than equity issuance due to the large amount of information available in the bond prospectus, reducing adverse selection concerns (Cantillo and Wright, 2000; Krebbers *et al.*, 2023). However, new bond issuance still suffers from information asymmetry due to the illiquid trading of bonds in secondary markets (Wang and Wu, 2023) as well as complex information disclosed in prospectuses (Li *et al.*, 2023).

Analysts, acting as a key intermediary between firms and markets, deliver a variety of information and signals about their covered firms to investors. Such information and signals can be valuable, as investors often lack sufficient value-relevant information. In this paper, we investigate whether the equity analysts' activity significantly affects the

demand for corporate bonds issued by a firm. These analysts influence the investment decisions of bond investors not only through their information flowing from stock markets to bond markets (Downing *et al.*, 2009), but also through their influence on stock prices, which may affect the demand and pricing of bonds in the secondary market (Merton, 1974). In addition, relative to bond analysts, equity analysts cover much more public firms, resulting in wider value relevant information contained in the research outputs they provide for potential bond investors.

A large literature provides plenty of evidence on the 'bright side view' of analyst activity on the firm's information environment. First, by playing a key informational role in security markets through interpretation and discovery of information (Asquith *et al.*, 2005; Li, 2020; Lof and Van Bommel, 2023), analysts provide numerous future insights about their covered firms to capital markets (Chen *et al.*, 2010; Charitou *et al.*, 2019) that can stimulate more investor responses in the primary and secondary markets (Lehavy *et al.*, 2011). Second, as one of most important external monitoring agents, analysts' activities may send the investors a positive signal of a firm's governance. Interaction with firm management and a transparent information environment contributed by analyst activities make it difficult for the management to engage in earnings management (Yu, 2008; Irani and Oesch, 2013), fraud (Dyck *et al.*, 2010; Yin *et al.*, 2020), and other value-destroying activities (Chen *et al.*, 2015). Third, firms are more visible in markets when analysts engage in the market promotion (Merton, 1987), which increases investor awareness and recognition. Analysts' coverage choice itself, to some extent, signals firms' future prospects to capital markets (Bradshaw *et al.*, 2006). Consistent with the influence of analysts on reducing information asymmetry, improving monitoring effectiveness, and enhancing firm visiting, we argue that demand for bonds issued by firms with more analysts activity is higher.

However, the 'dark side view' argues that analyst activities do not send credible signals of the real conditions of firms to market investors. For instance, analysts imposing excessive importance on the short-term financial performance of firms may induce myopic behaviours and earnings management (He and Tian, 2013; Irani and Oesch, 2016), which subsequently results in unexpectedly high accuracy of forecasts (i.e., smaller differences between analysts' estimates and firms' reported earnings) if analysts' estimates are based on the management's misleading earnings numbers (Louis *et al.*, 2013) instead of the real condition of the firms. Likewise, the literature also provides evidence that analysts' incentive to misinform markets may stem from tipping and close ties with firm management (Chung and Jo, 1996; Chen and Matsumoto, 2006; Bradley *et al.*, 2017). This may result in analysts being interpreted as an untrusted signal of a transparent information environment and firms' commitments to corporate governance and performance. Given that institutional investors are a principal component of bond markets, they are more sophisticated and more likely to possess the ability to distinguish credible signals of analysts from untrusted ones. In line with the 'dark side view', we argue that investors in bond markets are less likely to invest in firms with high analysts activity.

In this paper, we test the two competing views on the real role of analysts in bond markets by examining the relationship between analyst activities and investor demand for bonds of covered firms. We investigate the orderbook size of 8,563 fixed-coupon investment grade corporate bonds issued by 1,279 public firms from 38 countries between the period from 2008 to 2022. We use three measures of analyst activities. To proxy the quality of analyst earnings forecasts, we follow Mansi *et al.* (2010) to measure both *Forecast Accuracy*, which is the absolute value of the analyst forecast error (i.e., difference between the actual EPS and the average EPS forecast) scaled by

the stock price at the end of each fiscal year, and *Forecast Dispersion*, which is the standard deviation of analyst earnings forecasts scaled by the stock price at the end of each fiscal year. We then measure analyst coverage (*Coverage*) based on the number of analysts covering a particular firm in a given year. Following Krebbers *et al.* (2023), we construct our dependent variable investor demand, denoted as *Oversubscription*, which is the ratio of orderbook size to the issue amount of that bond. Due to the lower liquidity of a corporate bond in its secondary market (Hotchkiss and Ronen, 2002; Asquith *et al.*, 2013), the level of oversubscription in the primary market reasonably and accurately measures investors' overall bond demand. [4]

After controlling for a range of firm, bond, and country characteristics, our baseline results show a significantly positive relation between analyst coverage and oversubscription. We also find that analyst forecast accuracy (dispersion) is significantly positively (negatively) associated with the level of oversubscription. The results are robust after addressing the endogeneity issue and using alternative measures of investor demand. The statistically and economically significant evidence supports the 'bright side view' that analysts play positive roles in mitigating information asymmetry by delivering credible information and signals of their covering firms to bond market investors.

Next, we investigate the bond heterogeneity by investigating the green bonds and debut bond offerings separately. We find that the investor demand is not significantly related to analyst forecast accuracy (dispersion) and coverage of the green bond issuers and only significantly related to the coverage of non-green bond issuers, which is consistent with the notion that green bonds have lower information asymmetry and

[4] Asquith *et al.* (2013) and Hotchkiss and Ronen (2002) indicates that bonds are most liquid at issue and are traded at very low level in secondary markets.

better signalling associated with firms' environment commitment (Flammer, 2021; Risal *et al.*, 2023). We then find that the analysts' impact on oversubscription for debut bond issuers is no greater than that for seasoned bond issuers, which is consistent with the finding of Cai *et al.* (2007) who suggest no significant information problem occurring with the debut of investment-grade bonds.

Given that analysts' activities are informative when the information asymmetry associated with a firm is higher, we also investigate the firm cross-sectional heterogeneity based on their information environment proxied using firm's beta, stock return volatility and business risks (standard deviation of cash flow from operations). We find that the impacts of analysts are more pronounced in issuers with high beta, high stock return volatility and high level of business risks, highlighting the positive role of the analysts as the information intermediary.

Likewise, we also argue that the information role of analysts would be important in firms with low ESG performance. Given the concerns that bondholders' claims are closely associated with ESG-related performance (Apergis *et al.*, 2022), we investigate firms' cross-sectional heterogeneity based on their ESG scores and carbon emission. We find that the impacts of analysts are also more pronounced in issuers with low ESG scores and high carbon emission. The results indicate that in spite of the intention to optimize the risk-return characteristics of their portfolio by investing in non-ESG firms, investors still demand more accurate information from more analysts to buffer themselves against risks (Kelly and Ljungqvist, 2012) arising from ESG-related liabilities. Altogether, our findings reveal that the value of analysts may extend beyond the risks in the markets and within the business itself (Mansi *et al.*, 2010; Loh and Stulz, 2018).

Our study contributes to the literature by adding evidence on the determinants that affect investor demand in bond markets. We shed light on the positive roles of analysts in the demand for bonds by showing that the level of oversubscription is strongly related to analyst activities, including their coverage decisions and the quality of their research outputs. Our results complement the empirical evidence of Krebbers *et al.* (2023) who demonstrate that credit risks and bond market presence are important factors in investor demand. Moreover, we contribute to the existing literature about market information asymmetry by showing that analysts are a key intermediary between firms and bond markets. Little existing research ascertains the relationship between analysts and information asymmetry in bond markets. Differently from prior studies that focus on cost of debt (Mansi *et al.*, 2010; Derrien *et al.*, 2016; Ferrer *et al.*, 2019), we provide a novel perspective on investors' real response to a certain bond or a certain issuer. Based on level of oversubscription, our study implies that analysts' credible information and signals indeed mitigate information asymmetry and thus affirmatively stimulate investors' demands.

The rest of this paper is organized as follows. Section 2 summarizes the literature review on roles of analysts in security markets, followed by developing hypotheses. Section 3 presents the sample and variables and describes the data. Section 4 presents the multivariate model and reports the results of empirical analysis. Section 6 concludes.

2. Related Literature and Hypotheses

2.1 Investor demand

The corporate bond market, as one of the largest financial markets all over the world, has its unique breakpoint of liquidity. A corporate bond's highest level of trading usually

occurs in the primary market and quickly loses liquidity after the issuance (Lo *et al.*, 2004). So, investors' demand for a bond or preference for an issuer are fully reflected in their subscription to a new bond at the 'bookbuilding' stage. For investors, due to the diversification benefits, a new bond's issuance is attractive as it allows them to actively adjust their portfolio. Thus, investors tend to have a demand for new bond issuance by their preferred firms (Asquith *et al.*, 2013). For bond issuers, bookbuilding is a procedure of extracting information from investors' bids, that is, a high level of oversubscription in the orderbook can provide them with a strong bargaining position in terms of setting the final terms of an offering (Miller and Puthenpurackal, 2002; Cornelli and Goldreich, 2003). Specifically, Derrien (2005) shows that larges investor' demand is associated with higher IPO prices and initial returns. Krebbers *et al.* (2023) also demonstrate that higher investor demand for corporate bonds increases the value of firms, and shortens the time to the next issuance, which further improves the strength of firms' access to capital. Hence, issuers are concerned about attracting sufficient demand for their offerings.

Moreover, offerings in the corporate bond market have lower information asymmetry compared to the equity market. Under the procedure of bond issuance, there is large amount of information available in the bond prospectus, reducing adverse selection concerns to a certain extent (Cantillo and Wright, 2000; Krebbers *et al.*, 2023). However, new bond issuance still suffers from information asymmetry due to illiquid trading of bonds in secondary markets (Wang and Wu, 2023) and complex information disclosed in prospectuses (Li *et al.*, 2023). Miller and Puthenpurackal (2002) indicate that investors are willing to pay a higher price for bonds with more detailed information disclosure and a better investment environment. Likewise, Easley and O'hara (2004) argue that investors demand a higher return for the information asymmetry since greater

information problem induces greater losses for them. In line with the prior studies, we argue that the information environment can affect investor demand for new bond issuance. To have a bargaining position, bond issuers should highlight the role of information, for example, increasing features such as analyst coverage (Easley and O'hara, 2004), to attract greater investor demand.

2.2 The 'bright side' of analyst activities

The literature that provides evidence on the 'bright side' generally argues that analysts' activities help reduce information asymmetry, have superior predictive abilities, enhance monitoring, and improve firm visibility. We argue that these factors can also improve the investor demand towards securities issued by the covered firms.

In relation to the information asymmetry and superior predictive abilities, the literature suggests that analysts derive their informational role from two main sources: the interpretation of public information and the discovery of new information (Ivković and Jegadeesh, 2004; Asquith *et al.*, 2005; Chen *et al.*, 2010). Analysts, being professionally trained with extensive knowledge and experience in the firm or industry, possess superior information processing abilities to promptly interpret, analyse, and forecast information (Chen *et al.*, 2010; Livnat and Zhang, 2012). Subsequently, they embed the interpretations and analyses in their reports, recommendations, or forecasts. Chen *et al.* (2010) demonstrate that analysts often discuss the impact of accounting methods, recompile financial statements for comparability over time and across peers, and infer implications of changes in firm strategy for future financial performance in their research following earnings announcements and information disclosures.

Prior studies have also investigated and recognised the value of analysts' roles in interpreting public information. Francis *et al.* (2002) and Frankel *et al.* (2006) examine

the information content of analyst research, revealing that the informativeness of firm disclosures and analyst information outputs complement each other rather than acting as substitutes. Both the studies indicate that analysts' interpretation plays a dominant role in mitigating information asymmetry in security markets. In addition, Lehavy *et al.* (2011) document that the informativeness of analysts' reports and investor demand for analysts' assistance in interpreting increases when firms' have less readable disclosures, such as 10-Ks. Yezegel (2015) also shows that analysts are more likely to increase information content after earnings announcements in response to heightened demand for advice from market participants and a high supply of information post-announcement, aiming to identify mispricing.

In addition to the superior expertise in information processing, analysts' forecasts rely on their privileged channels for information discovery, which may not be available to unsophisticated or uninformed investors who typically lack the knowledge, resources, and accesses to obtain private information and hard-to-detect public information (Ivković and Jegadeesh, 2004). Analysts acquire new information through their own independent research or through their access to firm management (Livnat and Zhang, 2012). In fact, analysts have opportunities to privately interact with firm management through conference calls, face-to-face meetings with CEOs, and to investigate operations directly (Malloy, 2005).[5]

The value of the information discovery and interpretation depends on the quantity

[5] However, this type of private information has become scarcer in U.S. after the enaction of Regulation Fair Disclosure (Reg FD) in 2000 which requires management to disclose material information to all market participants, which curbs analysts' information advantage from selective access to privileged management information (Koch *et al.*, 2013). Despite the enaction of Reg FD, analysts access to senior management remain an important source of analysts' information advantage post Reg FD (Green et al. 2014a). For example, exclusive broker-hosted investor conferences, as noted by Green et al. (2014b) and Bushee et al. (2011), enable analysts engage directly with management, acquiring valuable insights for analytical purposes.

and quality of the information environment. The information discovery value is negatively associated with the informativeness, as the demand for new information is lower when there is sufficient existing publicly disclosed information (Ivković and Jegadeesh, 2004; Chen *et al.*, 2010); while on the other side, information interpretation value is positively associated with the quantity and quality of the information environment, as the need for processing, interpreting, and analysing the publicly available disclosures becomes greater in a rich information environment (Francis *et al.*, 2002; Frankel *et al.*, 2006; Livnat and Zhang, 2012). Thus, when information uncertainty is high, the effects of analyst coverage on reducing information asymmetry and increasing market efficiency are stronger (Li, 2020).

With regard to effective monitoring, it has been argued that analysts can serve as external monitors of firms for several reasons (Jensen and Meckling, 1976). First, an extensive and in-depth industry knowledge, as well as their past experience, allows analysts to have superior abilities to monitor firms. They analyse financial information and evaluate strategies, decisions, and policies implemented by the management (Bradley *et al.*, 2017). In addition, communicating directly with management and raising questions in earnings announcement conference calls increase analysts' understanding of the firms (Bushee *et al.*, 2011; Green *et al.*, 2014a). Accordingly, analysts are more likely to identify firm riskiness and assess firm performance, which can restrain management from not acting in investors' best interests (Dyck *et al.*, 2010). In turn, management may reduce mismanagement and inefficient activities due to stringent inspection and scrutiny from sophisticated analysts (Irani and Oesch, 2013; Chen *et al.*, 2015).

Second, a transparent information environment due to analyst activities makes it difficult for a firm's management to engage in earnings management (Yu, 2008), fraud

(Yin *et al.*, 2020), credit events (Derrien *et al.*, 2016) and other value-destroying activities (Chung and Jo, 1996; Lang *et al.*, 2004; Jung *et al.*, 2012; Adhikari, 2016).

Third, analysts can monitor indirectly by propagating their opinions and advices, through earnings forecasts to investors, research reports to their clients, and their appearance in public media including TV programmes, newspapers, and other financial press, to a broader audience (Miller, 2006). This information distribution not only helps market participants to correctly gauge firm performance and detect managerial misbehaviours, but also helps board of directors to trace and investigate management activities. Consistent with this view, Farrell and Whidbee (2002) show that the financial press and analysts' increased scrutiny of firms with poor performance increase forced CEO turnover. As such, analysts play an important governance role in monitoring management behaviours to decrease agency costs and reduce firm uncertainties and risks (Sun, 2009; To *et al.*, 2018).

With regard to firm visibility, existing literature argues that analyst activities increase the visibility of covered firms and broaden the investor base in financial markets. For example, analysts are incentivized to engage in the promotion of securities that are underwritten by their brokerage houses and investment banks (Hong and Kubik, 2003; Juergens and Lindsey, 2009; Niehaus and Zhang, 2010; Groysberg *et al.*, 2011). The findings of Mola *et al.* (2012) corroborate the findings demonstrating a reduced presence of institutional investors and the loss of analyst coverage. Likewise, Mehran and Peristiani (2010) find that firms losing analyst coverage are more likely to go private due to a failure to attract sufficient visibility. O'brien and Tan (2015) observe that less-visible firms often leverage analyst who can increase the visiting of covered firms, which further enhances investor awareness and attraction towards the firm. Furthermore, analysts may choose to cover firms based on their forecast of superior

future performance (Bradshaw *et al.*, 2006). Consequently, higher analyst coverage signals greater potential for future performance, attracting investor attention and thereby increasing firm visibility.

Taken together, analysts' roles in improving the information environment, monitoring firm management effectively, and increasing covered firms' visibility can improve investors leaning towards the financial securities issued by the covered firms. Consistent with the investor recognition argument, extant literature provides considerable empirical evidence on the positive impacts of analysts on security markets. For example, Irvine (2003) finds a positive relation between analyst coverage and liquidity change to number, volume, return of stock transactions and ownership of institutional investors. Mansi *et al.* (2010) document that analyst activities including coverage, accuracy and lower dispersion forecasts are negatively associated with bond yield spreads. Derrien *et al.* (2016) show that the loss of analysts increases cost of debts. In addition, Galanti *et al.* (2022) demonstrate that firms' debt and share issuance benefits from the coverage of analysts, i.e., analyst coverage matters to firms' access to external finance. Given the above arguments, we make following hypothesis:

H1a*: Analyst activities increase investor demand for bonds issued by the covered firms.*

2.3 The 'dark side' of analyst activities

In contrast to the positive roles in information environment, monitoring, and visibility, several studies also provide evidence on the negative impacts of analyst activities. One main source of negative impact is the excessive pressure under which firm management is compelled to meet short-term earnings targets. Meeting analyst forecasts has become a more important threshold (Dechow *et al.*, 2003), after all, a short-run turmoil of equity and debt markets caused by a negative earnings surprise (i.e., missing analysts

forecasts) can be costly (Skinner and Sloan, 2002). However, analyst forecasts may be overly optimistic (Dechow *et al.*, 2000; Hong and Kubik, 2003; Jackson, 2005; Kothari *et al.*, 2016) making it difficult for the management to meet such targets (Ertimur *et al.*, 2011). Graham *et al.* (2005) corroborate the importance of meeting analyst forecasts and find that senior management works to maintain predictability in earnings and to hit earnings targets even to the detriment of long-term firm value. In line with the findings, He and Tian (2013) examine the causal effects of analyst coverage and find that analysts' pressure impedes firms' investment in long-term innovation. Irani and Oesch (2016) also find that management uses real activities manipulation, such as stifling firm innovation, to meet the short-term earnings expectations of analysts. Thus, analysts excessive pressure on management may induce myopic behaviours (Graham et al., 2005).

The second source of negative impacts is the exacerbation of information asymmetry. Analysts may deliver new or useful private information to a select group of market participants (Green *et al.*, 2014b), which could possibly exacerbate information asymmetry (Chung and Jo, 1996). Irvine *et al.* (2007) find that institutional trading volume is abnormally high before analysts' recommendations are publicly released, consistent with the tipping argument that these investors receive advance tips relevant to the contents of analysts' research reports. Juergens and Lindsey (2009) also document that analysts are rewarded for pre-releasing information.

The third source is the impaired monitoring resulting from the close ties between analysts and management. Although analysts' forecasts are more likely to be accurate when they receive more information from management (Chen and Matsumoto, 2006), close connections of analysts with the management may potentially bias analysts' judgements, undermining their incentives to monitor management behaviours (Bradley

et al., 2017), and thus cause an increase in firm risks and a decrease in firm value.

The fourth source is conflicts of interest stemming from investment banking or brokerage affiliations. Some studies argue that analysts' incentives to generate investment bank business, earn trading commissions for brokerage houses, and gain access to management as a source of private information can compromise their integrity and objectiveness; for example, they are motived to upwardly bias the forecasts and recommendations (Ertimur *et al.*, 2011; Guo *et al.*, 2020). Mola and Guidolin (2009) document that after their affiliated mutual funds invest in certain stocks, analysts tend to issue frequent and favourable ratings to upgrade the stock. Huyghebaert and Xu (2016) show that compared to unaffiliated analysts, affiliated analysts especially further upwardly distort post-IPO earnings forecasts. Previous research, such as Irvine (2000) and Jackson (2005), documents that analysts provide optimistic reports to generate more trades for their brokerage house, bringing higher trading commissions. Consequently, analysts' compensation incentives may induce biases in their coverage decisions and information outputs, thereby affecting investors' views on the reliability and credibility of analysts.

Due to the dark side of analyst activities, higher information asymmetry costs are more likely to scale down the size of corporate bond investor order in analysts covering firms (Krebbers *et al.*, 2023). Moreover, inadequate governance and disappointing long-term firm performance resulting from management myopia and other misbehaviours due to excessive analyst pressure could reduce the attraction towards securities issued by such firms. Furthermore, biases in analysts research outputs and coverage decisions not only exert negative effects on the credibility of analyst forecasts and market participants' reliability of analyst coverage, but also cause investors to make decisions contrary to those of analysts (Drake *et al.*, 2011). Accordingly, market

participants are less likely to invest in corporate bonds of firms with higher analyst coverage, higher accuracy, and lower dispersion. This leads to our competing hypothesis:

H1b*: Analyst activities decrease the investor demand for bonds issued by the covered firms.*

3. Data sources, Variables, and Descriptive Statistics

3.1 Data sources

We start with all corporate bonds that have information on orderbook size in Informa Global Markets (IGM) from 2008 to 2022. We only keep fixed coupon bonds that are categorized as investment grade. We exclude corporate bonds that have missing values issue amount and coupon. For each bond, we obtain the ISIN of the bond issuers (parent company) from the Standard & Poor (S&P) Capital IQ. We then obtain analyst information for the bond issuers from the Institutional Brokers Earnings Systems (I/B/E/S) database. Additionally, we collect firm-level data from the S&P Capital IQ, Datastream, and Refinitiv and country-level data from the Organization for Economic Cooperation and Development (OECD), the World Bank, and the International Monetary Fund (IMF). The final dataset contains 8,563 bonds issued by 1,279 firms from 38 counties for which we have complete information.

3.2 Main dependent variable: Investor demand

Investor demand for a bond, denoted by *Oversubscription*, is measured as the ratio of orderbook size to the issue amount of that bond (Krebbers *et al.*, 2023; Wang and Wu, 2023). As bond transactions mainly occur in the primary market (Asquith *et al.*, 2013), the level of investors' oversubscription in the primary market is a reasonably accurate measure of their overall bond demand.

We present the summary statistics for *Oversubscription* in Table 1. Panel A reports the summary of oversubscription across industries. Investors have the highest demand for a bond issued by a firm in Industrials (3.805), while the smallest demand is in Financials including Banks (2.310). Panel B reports the oversubscription across countries and shows that investors, on average, have a greater demand for a bond issued in China (3.378) and the U.S. (3.602). The results of Panels C-G display a higher oversubscription ratio for lower-rated, smaller issue, longer maturity bonds issued by smaller firms with a medium level of financial leverage, which suggests that there is on average a greater demand by investors for bonds with a high-risk profile. Perhaps this is a result of investors' targets for high returns.

3.3 Main independent variables: Analyst activities

Analyst information is obtained from the I/B/E/S annual consensus earnings forecast. Following Mansi *et al.* (2010), we construct *Forecast Accuracy* as the negative absolute value of the analyst forecast error, which is equal to the actual EPS minus the average EPS forecast scaled by the stock price at the end of each fiscal year. The higher value of *Forecast Accuracy* represents more accurate analyst earnings forecasts. We then construct *Forecast Dispersion*, which is defined as the standard deviation of analyst earnings forecasts scaled by the stock price at the end of each fiscal year. *Forecast Dispersion* increases with larger differences among analyst earnings forecasts. Finally, we measure *Coverage* as the natural log of number of analysts covering the firm.

3.4 Bond, firm, and country-level controls

We control for a series of bond, firm, and country characteristics. First, we control for a range of bond-level variables, including issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). We expect that

more bookrunners lead to higher bond demand since bookrunners are likely to increase bond visibility and tend to maximize bond demand to be more flexible in negotiating prices, determining final bond allocation, and protecting the success of the bond issue under weak market conditions (Krebbers *et al.*, 2023; Risal *et al.*, 2023). Second, we also include firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*), which have been shown to affect firms' access to debt financing, as the firm-level control variables. Specifically, firm size is often used to proxy a firm's information environment (Bharath *et al.*, 2009). Third, for country-specific characteristics, we include nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality* (Costantini and Sousa, 2022), which may influence investors to participate in bond subscriptions (Risal *et al.*, 2023). Investors' subscription is related to bond yields, which varies with the interest rates (i.e., country's economic conditions). A detailed definition of the variables is listed in Appendix A.

We present the descriptive statistics for the full sample in Table 2. As it shown, a firm, on average, has an oversubscription ratio of 3.312, which suggests that the investors demand, on average, is 3.312 times the issue size. An average firm is covered by around 21 analysts with 0.024 forecast errors and 0.009 forecast standard deviation, which are consistent with the numbers reported by the international analysis of Boubakri *et al.* (2015). Regarding the other characteristics, the average book value of total assets of the covered firms is around $7,234 million, which is consistent with the bond market findings that large firms are more likely to have access to external finance from bond markets (Hovakimian *et al.*, 2001). On average, one firm each year issues around $842 million bonds with a 2.416% coupon rate, which are averagely rated as BBB by the S&P rating agency. Average flight to safety and flight to quality are 0.650%

and 0.237%, respectively. Average GDP and nominal GDP growth of the bond issuers' countries are around $8,961 billion and 2.6%, respectively,

4. Empirical Analysis

4.1 Main results

The main aim of this study is to empirically examine how analyst forecast information and analyst coverage impact the investor demand for bonds. Using a multivariate approach, we estimate the baseline regression by the following model:

$$\begin{aligned} Oversubsciption_{ijt} = {} & \beta_0 + \beta_1 \times Forecast\ Accuracy_{ijt-1} \\ & + \beta_2 \times Forecast\ Dispersion_{ijt-1} + \beta_3 \times Coverage_{ijt-1} \\ & + \beta_4 \times Bond\ Controls_{ijt} + \beta_5 \times Firm\ Controls_{it-1} \\ & + \beta_6 \times Country\ Controls_{it-1} + Country \times Industry\ FE \\ & + Year\ FE + Currency\ FE + Maturity\ Bucket\ FE + \varepsilon_{it-1} \quad (1) \end{aligned}$$

Where $Oversubsciption_{ijt}$ is the dependent variable proxied for investor demand for bonds, measured by the ratio of orderbook size and issue size of bond *j* of firm *i* issued in year *t*. *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* are our main explanatory variables, which are proxied for the analyst information in the year preceding the bond tranche. *Control* variables are as discussed in section 3.4. The model also controls for fixed effects, including country × industry effects, year effects, currency effects, maturity bucket effects[6], to mitigate the possible concerns about unobservable heterogeneity that investor demand for a bond may vary with countries, industry sectors, markets, bond maturities, or change over time (Risal *et al.*, 2023; Wang and Wu, 2023).

[6] We consider the maturity characteristics of bonds as value of bonds may vary in the maturities (Merton, 1974). Based on maturity at the issuance, bonds are bucketed into four categories. That is, an indicator takes value of one if maturity of a bond is less than or equal to 5 years; two for maturity from 5 to 10 years; three for maturity from 10 to 30 years; and four for maturity above 30 years.

The main result of baseline regression is reported in Table 4. In Columns 1 and 2, quality of analysts' earnings forecasts is captured by *Forecast Accuracy* and *Forecast Dispersion*, respectively, whereas analyst coverage is captured in Column 3. We find that the analyst forecast accuracy and analyst coverage is significantly positively related to oversubscription at a 1% level of significance, while analyst forecast dispersion is significantly negatively related to oversubscription at a 5% level of significance. The results are consistent with H1a. Economically, we find that a one standard deviation increase in the *Forecast Accuracy* results in a 7.13% increase in oversubscription whereas a one standard deviation increase in *Forecast Dispersion* results in a 6.37% decrease in oversubscription. Likewise, a one standard deviation increase in *Analyst Coverage* results in a 12.67% increase in the oversubscription ratio.

Moreover, we include three proxies for analysts simultaneously. The result in Column 4 is similar to Columns 1-3. This finding suggests that investors are more likely to subscribe to bonds issued by firms with more analysts who provide a higher quality of forecasts due to a potentially better information environment, external monitoring, and visibility (Yu, 2008; Mehran and Peristiani, 2010; Derrien *et al.*, 2016; Ferrer *et al.*, 2019).

4.2 Robustness of main results

In this section, we test the robustness of our results. A major concern with our baseline regression estimation is the potential endogeneity problem of the quality of analysts' forecasts and the coverage of analysts. One may argue that the relationship between analysts and bond oversubscription could be driven by analysts' selection bias, i.e., analysts intentionally choosing to cover firms with better governance, information environment, or visibility. In addition, some unobserved measures of investor demand

for bonds are likely to affect the analyst forecast quality and analyst coverage. Despite the fixed effect regression model that has controlled for the possibility that endogeneity arises from unobserved bond-level, firm-level, industry-level, country-level, and time-invariant factors that may simultaneously determine the quality of analysts' forecasts, coverage of analysts, and investor demand, to further mitigate the endogeneity concerns, we implement 2SLS estimations with instrumental variables for *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage*. Likewise, we also utilize two alternative measures of investor demand to redo the baseline regression analyses.

4.2.1 2SLS Instrumental variable approach

We firstly adopt an identification strategy using instrumental variables to address the endogeneity problem of analyst forecast quality and analyst coverage. For analyst forecast quality, we use the average forecast accuracy (*Average Accuracy*) and the average forecast dispersion (*Average Dispersion*) as the instrumental variables. Following Boubakri *et al.* (2015), we calculate the average values by taking an average over time for each firm.[7] In general, a financial analyst typically focuses on a specific industry sector for a period of time, which leads to some degree of persistence in the ability of this analyst (Chen *et al.*, 2017), but this is less likely to be related to the investor demand for a bond of a given covered firm. Additionally, the average values over time are less likely to be related with the regression residual in a given year, which reduces the potential concern about the autocorrelations in the quality of analyst forecasts. For analyst coverage, we apply an instrumental variable "*Expected Coverage*" based on exogenous changes in the size of brokerage houses (in terms of the

[7] We also redo the 2SLS IV regressions for average forecast quality by excluding firms that only issued one bond in our sample to further reduce the concern about a potential contemporaneous relation between oversubscription and analyst forecast quality. The results are similar to those reported. Moreover, we employ industry-average forecast accuracy and industry-average forecast dispersion as the instrumental variables and find the results still remain qualitatively similar.

number of analysts employed by a brokerage house) following Yu (2008). The size of brokerage houses changes over time depending upon their own revenue or profit, which can affect the coverage decision of a certain firm; however, this is unlikely to be influenced by the bond demand of their covering firms and is less susceptible to the selection problem. It is worth noting that brokerage houses have a choice in which firms to stop covering, whereas the measure of expected coverage uses the tendency towards the coverage before a broker decides which firm to keep covering, and thus avoid the potential selection bias problem. So, the instrument can capture the exogenous variations in analyst coverage.

Following Yu (2008), we use the equation below to calculate expected coverage:

$$Expected\ Coverage_{ikt} = (Broker\ Size_{kt}/Broker\ Size_{k0}) * Coverage_{ik0}$$
$$Expected\ Coverage_{it} = \sum_{k=1}^{n} Expected\ Coverage_{ikt} \quad (2)$$

Where $Expected\ Coverage_{ikt}$ is the expected coverage of firm i covered by brokerage house k in year t. $Broker\ Size_{kt}$ and $Broker\ Size_{k0}$ are the number of analysts employed by the brokerage house k in year t and year 0 (i.e., benchmark year), respectively. $Coverage_{ik0}$ is the analyst coverage of firm i from brokerage house k in year 0. $Expected\ Coverage_{it}$ is the expected analyst coverage of firm i in year t.

In the spirit of Yu (2008), we use 2007 as the benchmark year, and require that a firm is covered by at least one brokerage house in the benchmark year. We drop all observations of the firms not covered in 2007. We also exclude all observations in 2007 from the 2SLS regression analysis since the *Expected Coverage* automatically sets as one in the benchmark year by design.

In Table 4, we present the 2SLS regression results. Columns 1, 3, and 5 show the first-stage regression results using *Forecast Accuracy*, *Forecast Dispersion*, and

Coverage as the dependent variable, respectively. The coefficients of *Average Accuracy*, *Average Dispersion*, and *Expected Coverage* are positive and significant at the 1% level, i.e., the instrumental variables are highly correlated with their corresponding main variables. Additionally, in untabulated results, we report that our instrumental variables are valid by rejecting the null hypotheses that the instrument is weakly identified. Columns 2, 4, and 6 display the results from the second-stage regressions with main variable replaced by the fitted values from the corresponding first-stage regressions. As can be seen, the coefficients of the main independent variable in Columns 2, 4, and 6 of Table 4 have the same signs and similar significance levels as well as having a greater magnitude than those in Table 3. Therefore, controlling for endogeneity, the 2SLS IV model confirms our baseline finding that there is a significant and positive relation of high analyst forecast quality and high analyst coverage with great investor demand for bonds issued by the covering firms.

4.2.2 Alternative measures of investor demand

We conduct an additional robustness check by employing two alternative proxies of investor demand. The main dependent variable is defined as the ratio of orderbook size to issue amount of that bond (i.e., the number of times). One alternative proxy is measured by the natural logarithm of the orderbook size (*Ln (Book Size)*). We show the results of the baseline regression model replaced by this alternative dependent variable measure in Panel A in Table 5. As we can see, the results are largely identical to those in Table 3. More specifically, the coefficients of three analyst variables remain similar in signs and statistically significant in Columns 1-3.

Likewise, we use residual oversubscription as an alternative measure. To address the issue of investor portfolio diversification, i.e. that the more bonds a given firm

issues, the lower investor demand for the firm's subsequent bonds is expected, we construct the variable of residual oversubscription ratio (*Resid Oversubscription*) following Risal *et al.* (2023) by regressing *Oversubscription* on the number of bonds issued by the firm prior to the bond issuance and the industry average oversubscription ratio. We use the alternative measure of dependent variable to redo the baseline regression and report the results in Panel B in Table 5. We find that the coefficients of three analyst variables in Columns 1-3 of Panel B are also similar to those in Table 3, indicating that the positive impacts of high analyst quality and high analyst coverage on investor demand remain unchanged. Overall, the robustness checks support our main results.

4.3 Bond-level heterogeneity

While our baseline findings indicate that analyst activities are related to the bond oversubscription, there can be significant heterogeneity in the informativeness of bonds based on both their type and market presence. Specifically, the literature argues that green bonds signal firms' commitment towards the environment through their commitment towards green projects, third-party green certification, and continuous assessment of the use of proceeds (Flammer, 2021). Given the lower information asymmetry surrounding green bonds, we expect the analyst activities to be less important for green bond subscription.

Likewise, some studies on the bond market presence show that the information asymmetry for seasoned bond issuances is lower due to the firm's market presence, which reduces bonds' adverse selection concerns (Cantillo and Wright, 2000). Krebbers et al. (2023) also find that information asymmetry is higher in debut bond issues and as such it requires stronger attributes and disclose extensive amount of information to

reduce such information asymmetry. Nevertheless, Cai *et al.* (2007) argue that significant information problems do not occur with investment-grade bond IPOs. Due to our focus on the traches of investment-grade bond, we argue that the relations of informative analyst activities with both debut bond issues and seasoned bond issues would be similar.

First, we investigate the shades of bonds. Columns 1-4 of Table 6 investigate the sub-sample of green bonds and Columns 5-8 examines the sub-sample of non-green bonds. The coefficients of three analyst variables in Columns 1-4 are insignificant. Nevertheless, we find significant associations between the oversubscription ratio of non-green bonds and three analyst variables (i.e., *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage*) in Columns 5-7. More specifically, for non-green bonds, a one standard deviation increase in *Forecast Accuracy* and *Coverage* significantly increases *Oversubscription*'s standard deviation by 4.15% and 2.88%, respectively, though the significance of *Coverage* disappears when we include three analyst variables in the regression simultaneously. *Forecast Dispersion* results in a 3.61% reduction in *Oversubscription*'s standard deviation. It shows that the impact we see in our baseline results is largely driven by the influence of analyst activities on non-green bonds.

Second, we investigate the debut and seasoned bond offerings. The results are presented in Table 7. Columns 1-4 of Table 7 investigate the sub-sample of debut bonds and Columns 5-8 examines the sub-sample of seasoned bonds. We show that the coefficient of *Forecast Accuracy* in Column 1 is significant at the 1% level, while the coefficients of both *Forecast Dispersion* in Column 6 and *Coverage* in Column 7 are significant at the 5% level, which reveals that the influence of analysts on debut bond offerings are similar to that on seasoned bond offerings.

4.4 Firm-level heterogeneity

4.4.1 Information uncertainty

Our main results show significant associations of great investor demand with high analyst coverage and high analyst forecast quality, which are consistent with our prediction. In this section, we further investigate how analysts impact bond investors' demand when their covered firms face to high uncertainties. Prior studies suggest that the informational role, monitoring role, and visibility effects of analysts are more important for firms with poor performance (Dyck *et al.*, 2010; Chen *et al.*, 2017; To *et al.*, 2018). So, if the arguments for the positive roles of analysts hold, analysts' impacts on bond investors' oversubscription should be more pronounced when the issuers have high uncertainties. To test the conjecture, we use sub-sample analysis by splitting the full sample into high uncertainty group and low uncertainty group based on the median of uncertainty variables: systematic risks, stock return volatility, and business risks. We measure the proxies in the year before investors' bond subscription to reduce endogeneity concerns.

First, we use stock beta, defined in Appendix A, to proxy for firm uncertainty about systematic risks. Columns 1-4 of Table 8 present the results of the high Beta sub-group. The estimated coefficient of *Forecast Accuracy* in Column 1 is positive and significant at the 1% level. In Column 2, the coefficient of *Forecast Dispersion* is negative and significant at the 10% level. The economic significance shows that a one standard deviation increase in *Forecast Accuracy* leads to a 5.66% increase in the *Oversubscription*' standard deviation, while a standard deviation increase in *Forecast Dispersion* is linked to a 3.17% decrease in the *Oversubscription*' standard deviation. The coefficient of *Coverage* is significantly positive, showing that a one standard deviation increase in *Coverage* is associated with a 5.78% increase in *Oversubscription*'

standard deviation. When we include three variables in the regression simultaneously, the results (in Column 4) remain similar, except for the coefficient of *Forecast Dispersion* whose significance disappears. Conversely, the estimated coefficients of three analyst variables of the low Beta sub-group, as shown in Columns 5-8, are insignificant and lower in magnitude. In line with our results, Loh and Stulz (2018) find that analyst outputs become more valuable when firm uncertainty is high because investors find it harder to assess firms' prospects.

The second measure we use to proxy for firm uncertainty is stock volatility. We report the results of the sub-sample analysis in Table 9 and show that both *Forecast Accuracy* in Column 1 and *Coverage* in Column 3 are significantly and positively related to investor demand when firms suffer from high volatility. The estimated coefficients represent that a one standard deviation increase in *Forecast Accuracy* and *Coverage* is related to a 7.31% and 13.54% increase in *Oversubscription*, respectively (i.e., 4.10% and 7.60% increase in investors' oversubscription ratio' standard deviation, respectively). The relation between *Forecast Dispersion* and investors' oversubscription in Column 3 is insignificant. The result for the three analyst variables in Column 4 is consistent with Columns 1-3. In contrast, the estimated coefficients of all the analyst activities are insignificant for the low volatility sub-sample.

Finally, we use business risk, measured as the standard deviation of operation cash flow, as another proxy of firm uncertainty. In addition to stock volatility, business risk is also a proxy for firm uncertainty about idiosyncratic risks. The results are reported in Table 10. *Forecast Accuracy* in Columns 1 and 4 and *Coverage* in Columns 3 and 4 in Table 11 are significantly positively associated with investors' *Oversubscription*, while *Forecast Dispersion* in Columns 2 and 4 are insignificant, similarly to the results in Table 10. Moreover, the results of regressions for the low business risks sample show

that the coefficients of three variables in Columns 5-7 are insignificantly negative, suggesting that impacts of analysts are less important in firms with low business risks, though the coefficient of *Forecast Dispersion* of all variable-included regressions in Column 8 is significant and negative. The results are consistent with the finding of Mansi *et al.* (2010) who indicate that analysts' impacts on cost of debt are most pronounced when uncertainty about firm value (i.e., idiosyncratic risk) is highest. Thus, we find consistent results that the impact of analyst activities on oversubscription is pronounced in firms with high uncertainty risks.

4.4.2 ESG and climate performance

Prior studies show that higher ESG performance captures the firms' higher commitment to stakeholders and is linked to better stakeholder engagement, which tends to limit the firms' myopic behaviours (Bénabou and Tirole, 2010; Eccles *et al.*, 2014), leading to lower agency and monitoring costs and higher market rewards (Banerjee *et al.*, 2022). Better ESG is also negatively associated with firm risks as environmentally friendly and socially responsible firms are less likely to suffer from regulation, litigation, or reputation risks (Hong and Kacperczyk, 2009). Importantly, firms with higher ESG performance are more likely to provide more credible reports and publicly disclose their ESG strategies and practices (Dhaliwal *et al.*, 2011), which increases information transparency. Given that firms with poor ESG performance have higher information asymmetry and are associated with higher risks, we expect the analyst activities to be more important in the sub-sample of firms with low ESG performance.

To examine our conjecture, we split the sample into high ESG group and low ESG group based on the median of firms' ESG scores. The results of the high ESG group and those of the low ESG are reported in Columns 1-4 and Columns 5-10 in Table 11,

separately. We find that *Forecast Accuracy* is significantly and positively associated with *Oversubscription* in both the high ESG group (Column 1) and the low ESG group (Column 5). However, the economic magnitude of *Forecast Accuracy* is larger in the low ESG group (Column 5) compared to those in the high ESG counterpart (Column 1). A one standard deviation increase in *Forecast Accuracy* leads to an 8.93% increase in oversubscription in low ESG firms whereas it only leads to a 7.76% increase in high ESG firms.

In addition, the coefficient of *Coverage* (Column 7) is significant and positive in the low ESG group only. Accordingly, the impacts of analyst *Coverage* are stronger on investor demand in firms with lower ESG scores, which is consistent with our conjecture.

Next, we investigate the climate performance dimension of firms: carbon emissions. The literature argues that the higher the carbon emissions, the more complex the methods used to account for GHG emissions and more uncertainty is around the assumptions (Fan *et al.*, 2021). Higher carbon emissions exacerbate the information opaqueness and would highlight the need for external assurance (Fan *et al.*, 2021). Cao *et al.* (2022) show that analysts pay close attention to carbon emissions; hence, their activities such as coverage, accuracy, and dispersion would be more important for firms with high carbon emissions.

To test our conjecture, we examine how analysts affect investor demand for the bonds of firms with different carbon emission.[8] We split the sample into high carbon emission group and low carbon emission group. We present the results of the high carbon emission group in Columns 1-4 and low carbon emission group in Columns 5-

[8] We also use carbon intensity measured by total emission divided by sales to proxy carbon footprint. The untabulated results are qualitatively similar to those in Table 12.

10 in Table 12, separately. As shown in Columns 1-3, *Forecast Accuracy* and *Coverage* have a positive association with *Oversubscription* at the 10% and 1% significance levels, respectively. More specifically, the economic significance shows that a one standard deviation increase in *Forecast Accuracy* and *Coverage* results in a 7.91% and 19.43% increase in investor demand, respectively. We also find a significant and negative relationship between *Forecast Dispersion* and *Oversubscription* when the firms have high carbon emission. A one standard deviation increase in *Forecast Dispersion* results in a 12.97% decrease in *Oversubscription*. When we include the three main explanatory variables in the regression model simultaneously, the results of the high carbon emission group (in Column 4) remain similar, except for the coefficient of *Forecast Accuracy* becoming insignificant.

By comparison, in the low carbon emission group, only *Coverage* has a significantly positive relation with *Oversubscription*; however, the magnitude of the coefficient (i.e., a 11.13% increase in the oversubscription ratio resulted by a one standard deviation increase in analyst coverage) is smaller relative to that (i.e., a 19.43% increase in oversubscription) in the high carbon emission group. Thus, we show that analysts play a more important and positive role in investor demand when their covering firms have more carbon emissions. The results are mostly consistent with our conjecture.

5. Conclusions

In this paper, we explore the role of analysts in investor demand for corporate bonds. Using an extensive sample of worldwide public bond tranches, we show that firstly investors have greater demand for corporate bonds issued by firms with a higher quality of analyst forecasts (i.e., higher forecast accuracy or lower forecast dispersion). We also

find that investor demand is positively related with the high coverage of analysts in the bond issuers. Our main results are consistent with the hypotheses that analysts play a positive role in reducing information asymmetry associated with bond issuers, supporting the bright side view. Prior studies suggest that analysts' coverage or characteristics are related with covering firms' access to external finance based on costs of external financing (Mansi *et al.*, 2010; Derrien *et al.*, 2016; Luong *et al.*, 2021). We contribute to the literature by highlighting a more direct proxy of access to external finance: bond investors' oversubscription ratio is influenced by analysts. We address the endogeneity concerns by adopting a 2SLS IV approach and employing alternative measures of investor demand and find that the main results are robust.

Given the findings of the informative role of analyst activities in corporate bond issuance, we conjecture that the impact of analyst activities would be more pronounced in bonds and firms in which the information asymmetry is higher. Accordingly, we investigate bond and firm level heterogeneity.

For bond heterogeneity, first, we find that the impact of analysts is stronger in non-green bonds compared to green bonds, in line with the literature that argues green bonds lower information asymmetry as they signal the environmental commitment of firms. Second, we find that the impact of analysts on bonds issued for the first time is no greater than that on seasoned bond issuance, in line with the literature that shows that despite increased bond market presence possibly reducing information asymmetry, the debut of investment-grade bonds has no significant association with information problem.

For firm level heterogeneity, first, our findings shed light on the positive role of analysts by showing that analysts are more important for firms with higher uncertainties

and risks. Specifically, we analyse the impacts of analyst forecast quality and analyst coverage in firms with varying degrees of systematic risks and idiosyncratic risks captured by stock beta, volatility risks and business operation risks, and find that such impacts on investor demand are more pronounced when firm uncertainties are higher.

Second, given the concern that the ESG and climate-related issues are closely associated with the bondholders' claims, we extend our analysis by examining how analysts impact the demand for bonds issued by firms challenged by ESG and climate performance. We show that analysts have stronger impacts in issuers with a low ESG score and higher carbon emissions. Our results suggest that despite investors' inclination to optimize the risk-return characteristics of their portfolio from investing in non-ESG firms, they still demand more accurate information from analysts to buffer themselves against risks arising from ESG-related liabilities. Altogether, our findings reveal that the value of analysts may extend beyond the uncertainties in the markets and within the business itself.

Overall, our findings provide support to the view that the ability of analyst information production and distribution, monitoring, and signalling, as reflected by their coverage and forecast quality, can increase investors' demand for their covering firms' bonds. Our study contributes to the existing literature on the role of analysts in bond markets and on the firms' access to external finance. We also offer several implications for market participants and regulators. Investors may pay more attention to the information outputs of financial analysts before their investment decisions. The analysts' outputs could not only be informative to increase their knowledge about the target firms, but also provide a signal of a relatively better governance environment. In addition, for regulators, they should raise higher requirements for analysts. The high quality of analysts' research outputs can help market participants to avoid a range of

risks when they pursue high returns and thus contribute to market stability.

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Appendix A. Variable Definitions

Notations	Variable Names	Descriptions
Panel A: Dependent variables:		
Oversubscription	Ratio of bond oversubscription	Orderbook size/issue size.
Ln (Book Size)	Orderbook size	Natural logarithm of the size of the orderbook in amount ($).
Panel B: Main explanatory variables:		
Forecast Accuracy	Accuracy of analyst forecasts	Negative absolute value of the difference between actual earnings per share and the average earnings forecast, scaled by the year-end stock price.
Forecast Dispersion	Dispersion of analyst forecasts	Standard deviation of analyst forecasts, scaled by the year-end stock price.
Coverage	Analyst coverage	Natural logarithm of one plus number of analysts.
Panel C: Other explanatory variables:		
Beta	Stock beta	Beta is obtained from Datastream which estimates for each corporate-year observation by regressing monthly returns using market model. In the normal case, the sample used is in the normal case 60 months of monthly returns.
Volatility	Price Volatility	Volatility is obtained from Datastream and is a measure of a stock's average annual price movement to a high and low from a mean price for each year.
Business Risk	Business risks	Standard deviation of cash flow from operations.
Carbon	Carbon intensity	Total CO2 emissions.
ESG	ESG scores	Refinitiv ESG scores.
D (Green)	Green bond	A dummy variable equals to 1 if the bond is green and 0 otherwise.
D (First)	First time issuer	A dummy variable equals to 1 if the bond is the debut for that firm and 0 otherwise.
Panel D: Bond-level control variables:		
Ln (Issue Size)	Bond issue size	Natural logarithm of the size of the bond issued.
Coupon	Fixed coupon rate	Plain vanilla fixed coupon rates offered for each bond.
Bond Rating	S&P Credit Rating	The numerical value is assigned to S&P Credit Rating for each tranche. The highest is 17 for AAA and 16 for AA+, and so on.
Bookrunners	Number of bookrunners	Total number of bookrunners.
Maturity Bucket	Maturity class	An indicator variable equals to 1 if a bond's maturity is less than or equal to 5 years; 2 for maturity from 5 to 10 years; 3 for maturity from 10 to30 years bonds; and 4 for maturity above 30 years.
Panel E: Corporate-level control variables:		
Ln (Total Assets)	Firm size	The natural logarithm of total assets.
Leverage	Debt-to-asset ratio	Total debts / total assets.

Notations	Variable Names	Descriptions
ROA	Return on assets	Operating income before depreciation / book value of total assets.
Panel F: Country-level control variables:		
Flight to Safety	Flight to safety	Difference between the long-term government bond rate and the short-term rate of the bond issuer country.
Flight to Quality	Flight to quality	Difference between long-term (i.e., 10-year) government bond rates of bond issued country and the benchmark long-term government bond rates. We use USA's long-term government bond rate as a benchmark for non-USA corporates and Germany's long-term government bond rate as a benchmark for USA corporates. The proxies for "safehaven" (benchmark) can be the long-term interest rate of the USA, Japan, or Germany, depending upon the relevance of the studies.
GDP Growth	Nominal GDP growth rate	The annual growth rate of the country's nominal gross domestic product (GDP).
Panel G: Alternative measure variables:		
Subscription	Bond subscription	The natural logarithm of orderbook size.
Residual oversubscription	Residual oversubscription	Residuals are obtained from regression of oversubscription on the nature log of the number of bonds issued before that issuance and the industry average orderbook size.
Panel H: Instrumental variable:		
Average Accuracy	Industry-average accuracy of analyst forecasts	An average of analyst forecasts accuracy based on industry class.
Average Dispersion	Industry-average dispersion of analyst forecasts	An average of analyst forecasts dispersion based on industry class.
Expected Coverage	Expected analyst coverage	Firm-level expected analyst coverage is the sum of all brokers' expected coverage in that firm, which is calculated by coverage of broker k multiplies by the ratio of its brokerage size in year t to its brokerage size in year 0.

Table 1: Summary statistics by categories

	No. of observations	No. of bonds	No. of firms	Mean	Median
Panel A: Oversubscription ratio: group by industry					
Banks	2,709	2,663	261	2.310	1.900
Financial Services	853	828	197	3.146	2.667
Insurance	170	168	65	3.378	2.900
Industrials	4,313	4,235	837	3.805	3.333
Utilities	1,142	1,114	148	3.590	3.067
Others	106	105	51	4.012	3.450
Panel B: Oversubscription ratio: group by country					
United States	2,972	2,902	556	3.602	3.200
United Kingdom	683	668	124	3.256	2.667
Germany	860	837	85	2.773	2.200
France	837	820	87	3.330	2.700
Netherlands	454	448	60	3.170	2.667
Italy	341	337	44	3.061	2.500
China	337	334	101	4.198	3.600
Japan	331	325	36	3.047	2.467
Others	2,478	2,444	476	3.005	2.400
Panel C: Oversubscription ratio: group by bond credit rating					
AAA	318	315	74	1.985	1.675
AA	662	656	92	3.033	2.475
A	2,971	2,923	449	3.290	2.800
BBB	3,667	3,589	815	3.645	3.167
BB	55	54	38	3.942	3.600
B	7	7	6	4.402	3.400
Below / NR	1,613	1,575	413	2.743	2.133
Panel D: Oversubscription ratio: group by issue size					
Large issue amount	3,097	3,084	508	2.781	2.400
Medium issue amount	3,098	3,090	871	3.285	2.800
Small issue amount	3,098	3,026	1,076	3.764	3.333
Panel E: Oversubscription ratio: group by maturity					
<= 5 years	1,606	1,593	587	2.865	2.357
5-10 years	4,101	4,056	1,044	3.175	2.600
10-30 years	2,886	2,864	931	3.527	3.000
> 30 years	700	686	327	3.790	3.333
Panel F: Oversubscription ratio: group by firm size					
Large firms	3,058	3,005	198	2.653	2.200
Medium firms	3,069	3,008	432	3.582	3.063
Small firms	3,064	2,999	1,015	3.617	3.167
Panel G: Oversubscription ratio: group by leverage					

High leverage	3,058	2,979	523	3.303	2.800
Medium leverage	3,061	3,008	603	3.337	2.800
Low leverage	3,060	3,018	608	3.219	2.667

The Table shows brief summary of oversubscription ratio by categories.

Table 2: Summary statistics for all sample

	Number of observations	Mean	S.D.	Minimum	25th Pct	Median	75th pct	Maximum
Oversubscription (Times)	8,563	3.312	1.815	1.250	2.000	2.800	4.200	7.875
Forecast Accuracy	8,514	-0.024	0.088	-3.245	-0.022	-0.008	-0.002	-0.000
Forecast Dispersion	8,549	0.008	0.021	0.000	0.002	0.005	0.010	1.700
Number of Analysts	8,563	21.097	8.708	1.000	16.000	21.000	27.000	56.000
Coverage	8,563	2.985	0.505	0.693	2.833	3.091	3.332	3.584
Issue Size (US$ Mn)	8,563	841.541	479.016	147.203	500.000	738.072	1,027.957	2,837.520
Ln (Issue Size)	8,563	6.591	0.540	4.992	6.215	6.604	6.935	7.951
Coupon	8,563	2.316	1.538	0.000	1.000	2.125	3.375	6.500
Bond Rating	8,563	9.248	4.157	1.000	8.000	10.000	12.000	17.000
Bookrunners	8,563	4.786	2.488	1.000	3.000	4.000	5.000	16.000
Total Assets (US$ Mn)	8,541	7,234.282	33550.179	2.665	33.381	106.013	768.901	225,554.8
Ln (Total Assets)	8,560	18.022	2.170	9.753	16.931	18.048	19.451	21.810
ROA	8,371	4.762	5.002	-4.870	1.000	3.690	6.700	24.560
Leverage	8,551	0.789	3.357	0.001	0.205	0.313	0.425	28.620
Volatility	8,332	21.098	6.438	10.480	16.080	20.060	25.210	39.900
Beta	8,544	1.048	0.459	0.000	0.731	1.032	1.357	2.272
Business Risks	8,476	0.014	0.019	0.000	0.002	0.007	0.018	0.101
Flight to Safety	8,552	0.650	0.850	-4.931	0.012	0.463	1.139	5.598
Flight to Quality	8,552	0.237	1.731	-2.877	-1.377	0.039	1.816	6.457
GDP (US$ Bn)	8,563	8,960.644	9,126.986	21.718	1,542.660	3,186.860	20,893.744	22,996.100
GDP Growth (Nominal)	8,513	0.026	0.070	-0.257	-0.023	0.040	0.073	0.579

The Table presents summary statistics for all sample.

Table 3: Baseline regression

	(1)	(2)	(3)	(4)
Forecast Accuracy	0.8107***			0.6188**
	(3.31)			(2.44)
Forecast Dispersion		-5.7905***		-4.1821**
		(-2.80)		(-1.98)
Coverage			0.1351**	0.1116*
			(2.31)	(1.84)
Ln (Issue Size)	-0.7690***	-0.7659***	-0.7921***	-0.7846***
	(-14.91)	(-14.78)	(-15.06)	(-14.80)
Coupon	0.0643**	0.0665**	0.0616**	0.0699***
	(2.51)	(2.58)	(2.41)	(2.71)
Bond Rating	0.0082	0.0069	0.0064	0.0060
	(1.45)	(1.22)	(1.13)	(1.06)
Bookrunners	0.0069	0.0069	0.0067	0.0065
	(0.58)	(0.59)	(0.57)	(0.55)
Total Assets	-0.0267*	-0.0236*	-0.0335**	-0.0330**
	(-1.91)	(-1.68)	(-2.29)	(-2.21)
ROA	0.0248***	0.0246***	0.0251***	0.0229***
	(3.58)	(3.54)	(3.66)	(3.30)
Leverage	-0.0012	-0.0007	-0.0010	-0.0004
	(-0.18)	(-0.11)	(-0.15)	(-0.06)
Flight to Safety	0.0666	0.0658	0.0538	0.0675
	(1.23)	(1.22)	(1.01)	(1.25)
Flight to Quality	0.0608	0.0619	0.0535	0.0618
	(1.32)	(1.34)	(1.16)	(1.34)
GDP Growth	-0.2555	-0.3561	-0.2464	-0.3009
	(-0.45)	(-0.63)	(-0.44)	(-0.53)
Constant	8.4750***	8.4332***	8.3569***	8.4019***
	(21.56)	(21.36)	(21.35)	(21.27)
Country x Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes
Observations	8,248	8,248	8,296	8,248
Adjusted R2	0.2583	0.2581	0.2580	0.2590

This table shows the results of the impact of analysts on investor demand for bonds. The dependent variable is Oversubscription. Models 1–3 provides the regression results of Forecast Accuracy, Forecast Dispersion, and Coverage, respectively. Model 4 includes the three proxies of analysts in regression simultaneously. We include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (Ln (Issue Size)), Coupon, S&P credit rating (Bond Rating), and number of bookrunners (Bookrunners). At firm level, we control for firm size (Ln (Total Assets)), firm profitability (ROA), and financial leverage (Leverage). At country level, we control for nominal GDP growth (GDP Growth), and control for the effects of Flight to Safety and Flight to Quality. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: 2SLS IV Regression

	(1) First stage	(2) Second stage	(3) First stage	(4) Second stage	(5) First stage	(6) Second stage
Average Accuracy	0.797***					
	(0.236)					
Forecast Accuracy		2.308***				
		(0.740)				
Average Dispersion			0.968***			
			(0.042)			
Forecast Dispersion				-11.681***		
				(3.609)		
Expected Coverage					0.516***	
					(0.018)	
Coverage						0.371***
						(0.107)
Ln (Issue Size)	-0.001	-0.765***	0.000	-0.761***	0.060***	-0.865***
	(0.002)	(0.052)	(0.000)	(0.052)	(0.010)	(0.056)
Coupon	-0.002*	0.072***	0.000	0.073***	0.005	0.074***
	(0.001)	(0.026)	(0.000)	(0.026)	(0.005)	(0.027)
Bond Rating	-0.000	0.008	-0.000**	0.006	0.004***	0.002
	(0.000)	(0.006)	(0.000)	(0.006)	(0.001)	(0.006)
Bookrunners	0.000	0.007	0.000	0.007	-0.002	0.007
	(0.000)	(0.012)	(0.000)	(0.012)	(0.002)	(0.012)
Ln (Total Assets)	0.000	-0.028**	0.000	-0.021	0.024***	-0.049***
	(0.001)	(0.014)	(0.000)	(0.014)	(0.004)	(0.017)
ROA	0.001***	0.022***	-0.000***	0.023***	0.001	0.027***
	(0.000)	(0.007)	(0.000)	(0.007)	(0.002)	(0.007)
Leverage	-0.000	-0.000	0.000	0.000	-0.003	-0.002
	(0.000)	(0.006)	(0.000)	(0.006)	(0.002)	(0.007)
Flight to Safety	-0.004*	0.076	0.000	0.070	-0.005	-0.023

	(0.003)	(0.054)	(0.000)	(0.054)	(0.009)	(0.048)
Flight to Quality	-0.006***	0.069	0.001***	0.067	0.007	0.032
	(0.002)	(0.046)	(0.000)	(0.046)	(0.007)	(0.036)
GDP Growth	-0.011	-0.228	-0.016***	-0.443	-0.161	-0.141
	(0.025)	(0.567)	(0.004)	(0.566)	(0.122)	(0.597)
Observations	8248	8248	8248	8248	7743	7743
Weak Identification		11.401		522.616		860.308

The table shows the results of 2SLS IV regressions. In first stage, the dependent variables are *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage*, respectively. We employ average analyst quality (i.e., *Average Accuracy* and *Average Dispersion*) and expected analyst coverage (i.e., *Expected Coverage*) as the instrumental variables. In second stage, the dependent variable is *Oversubscription*. The main explanatory variables are predicted value of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage*, respectively. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Alternative measures of investor demand

	(1)	(2)	(3)	(4)
Panel A: Alternative measure of investor demands: Ln (Book Size)				
Forecast Accuracy	0.2611***			0.2135**
	(3.21)			(2.46)
Forecast Dispersion		-1.5410**		-0.9835
		(-2.38)		(-1.47)
Coverage			0.0425**	0.0360**
			(2.45)	(2.00)
Ln (Issue Size)	0.8008***	0.8015***	0.7940***	0.7955***
	(49.52)	(49.44)	(48.38)	(48.15)
Coupon	0.0262***	0.0265***	0.0249***	0.0277***
	(3.27)	(3.30)	(3.14)	(3.44)
Bond Rating	0.0049***	0.0045**	0.0042**	0.0042**
	(2.70)	(2.51)	(2.34)	(2.34)
Bookrunners	0.0058	0.0059	0.0057	0.0057
	(1.57)	(1.57)	(1.55)	(1.53)
Total Assets	-0.0088**	-0.0079*	-0.0110**	-0.0110**
	(-2.02)	(-1.82)	(-2.46)	(-2.42)
ROA	0.0066***	0.0067***	0.0068***	0.0061***
	(3.40)	(3.41)	(3.48)	(3.12)
Leverage	-0.0006	-0.0005	-0.0005	-0.0004
	(-0.31)	(-0.25)	(-0.27)	(-0.19)
Flight to Safety	0.0128	0.0123	0.0083	0.0129
	(0.78)	(0.74)	(0.51)	(0.78)
Flight to Quality	-0.0020	-0.0020	-0.0042	-0.0020
	(-0.14)	(-0.14)	(-0.29)	(-0.14)
GDP Growth	-0.0276	-0.0552	-0.0290	-0.0366
	(-0.15)	(-0.31)	(-0.16)	(-0.20)
Constant	2.3311***	2.3194***	2.2933***	2.3096***
	(19.28)	(19.14)	(19.00)	(19.00)
Country x Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes
Observations	8,248	8,248	8,296	8,248
Adjusted R2	0.5318	0.5314	0.5331	0.5322
Panel B: Alternative measure of investor demands: Residual Oversubscription				
Forecast Accuracy	0.8152***			0.6325**
	(3.27)			(2.45)
Forecast Dispersion		-4.8017**		-3.2618
		(-2.27)		(-1.51)
Coverage			0.2406***	0.2216***
			(3.95)	(3.51)
Ln (Issue Size)	-0.6803***	-0.6781***	-0.7213***	-0.7153***
	(-13.15)	(-13.05)	(-13.64)	(-13.43)
Coupon	0.0595**	0.0606**	0.0589**	0.0663**
	(2.31)	(2.34)	(2.30)	(2.56)

Bond Rating	0.0173***	0.0163***	0.0144**	0.0141**
	(3.06)	(2.87)	(2.55)	(2.49)
Bookrunners	0.0105	0.0106	0.0097	0.0096
	(0.91)	(0.91)	(0.84)	(0.83)
Total Assets	0.0383***	0.0410***	0.0236	0.0236
	(2.67)	(2.84)	(1.57)	(1.54)
ROA	0.0249***	0.0250***	0.0243***	0.0223***
	(3.57)	(3.57)	(3.50)	(3.18)
Leverage	0.0039	0.0042	0.0043	0.0048
	(0.63)	(0.68)	(0.65)	(0.74)
Flight to Safety	0.0927*	0.0912*	0.0787	0.0922*
	(1.69)	(1.65)	(1.45)	(1.67)
Flight to Quality	0.0121	0.0123	0.0030	0.0106
	(0.26)	(0.26)	(0.06)	(0.23)
GDP Growth	-0.2778	-0.3638	-0.2522	-0.2898
	(-0.49)	(-0.64)	(-0.44)	(-0.51)
Constant	3.3337***	3.2971***	3.1761***	3.2183***
	(8.43)	(8.30)	(8.07)	(8.10)
Country x Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes
Observations	8,248	8,248	8,296	8,248
Adjusted R2	0.1479	0.1473	0.1493	0.1504

This table presents the results of robustness check for the impact of analyst information on different measures of investor demand for bonds. Panel A and B demonstrate the results of regressions on *Ln (Book Size)* and *Residual Oversubscription,* respectively. Models 1–3 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage*, respectively. Model 4 includes the three proxies of analysts in regression simultaneously. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Green bonds vs. non-green bonds

	Green Bonds				Non-green bonds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	0.4377			0.1004	0.8357***			0.6533**
	(0.22)			(0.06)	(3.36)			(2.52)
Forecast Dispersion		-1.9572		-1.8971		-5.9533***		-4.2008*
		(-0.14)		(-0.14)		(-2.79)		(-1.91)
Coverage			0.2195	0.2466			0.1064*	0.0854
			(1.15)	(1.11)			(1.74)	(1.37)
Ln (Issue Size)	-0.5010**	-0.4990**	-0.5499**	-0.5209**	-0.7662***	-0.7629***	-0.7824***	-0.7775***
	(-2.20)	(-2.21)	(-2.41)	(-2.28)	(-14.58)	(-14.45)	(-14.57)	(-14.37)
Coupon	0.1336	0.1327	0.1429	0.1428	0.0611**	0.0634**	0.0576**	0.0663**
	(1.24)	(1.23)	(1.36)	(1.32)	(2.29)	(2.37)	(2.17)	(2.48)
Bond Rating	-0.0047	-0.0049	-0.0039	-0.0063	0.0109*	0.0095*	0.0089	0.0089
	(-0.18)	(-0.19)	(-0.16)	(-0.24)	(1.91)	(1.67)	(1.56)	(1.56)
Bookrunners	-0.0074	-0.0085	-0.0129	-0.0103	0.0073	0.0075	0.0074	0.0072
	(-0.16)	(-0.19)	(-0.29)	(-0.23)	(0.60)	(0.62)	(0.61)	(0.59)
Total Assets	-0.0748	-0.0732	-0.0661	-0.1039	-0.0274*	-0.0242*	-0.0321**	-0.0314**
	(-0.98)	(-0.96)	(-1.05)	(-1.36)	(-1.94)	(-1.71)	(-2.16)	(-2.11)
ROA	0.0190	0.0193	0.0200	0.0180	0.0249***	0.0247***	0.0257***	0.0233***
	(0.54)	(0.55)	(0.59)	(0.52)	(3.56)	(3.52)	(3.70)	(3.32)
Leverage	-0.0246***	-0.0243**	-0.0230***	-0.0252**	0.0013	0.0016	0.0013	0.0020
	(-2.94)	(-2.45)	(-2.89)	(-2.48)	(0.18)	(0.24)	(0.19)	(0.28)
Flight to Safety	0.5588**	0.5547**	0.5771**	0.5722**	0.0846	0.0840	0.0746	0.0862
	(2.27)	(2.25)	(2.32)	(2.29)	(1.53)	(1.51)	(1.36)	(1.55)
Flight to Quality	-0.2681	-0.2676	-0.2832	-0.2843	0.0672	0.0679	0.0602	0.0689
	(-1.27)	(-1.26)	(-1.34)	(-1.32)	(1.43)	(1.44)	(1.28)	(1.46)
GDP Growth	1.5233	1.4911	1.4573	1.4889	-0.1887	-0.2958	-0.1879	-0.2363
	(0.80)	(0.76)	(0.77)	(0.75)	(-0.31)	(-0.49)	(-0.31)	(-0.39)

Constant	7.5255***	7.4986***	7.0149***	7.4936***	8.4187***	8.3753***	8.3007***	8.3516***
	(4.18)	(4.17)	(4.43)	(4.20)	(20.92)	(20.73)	(20.68)	(20.67)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	515	515	523	515	7,712	7,712	7,752	7,712
Adjusted R2	0.2580	0.2580	0.2612	0.2569	0.2674	0.2671	0.2667	0.2679

The table presents the comparative analysis results of analyst' impacts on green bonds and non-green bonds' demands. The dependent variable is Oversubscription. Models 1–4 provides the regression results of Forecast Accuracy, Forecast Dispersion, and Coverage on investor demand for green bonds. Models 5–8 provides the regression results of Forecast Accuracy, Forecast Dispersion, and Coverage on investor demand for non-green bonds. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (Ln (Issue Size)), Coupon, S&P credit rating (Bond Rating), and number of bookrunners (Bookrunners). At firm level, we control for firm size (Ln (Total Assets)), firm profitability (ROA), and financial leverage (Leverage). At country level, we control for nominal GDP growth (GDP Growth), and control for the effects of Flight to Safety and Flight to Quality. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: Debut bonds vs. Seasoned bonds

	Debut bonds				Seasoned bonds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	0.8106***			0.9476***	0.7462			0.4638
	(3.56)			(3.92)	(1.56)			(1.02)
Forecast Dispersion		-0.3376		5.0045		-5.8521**		-5.0042**
		(-0.06)		(0.93)		(-2.52)		(-2.04)
Coverage			0.0156	-0.0478			0.1499**	0.1499**
			(0.13)	(-0.40)			(2.26)	(2.17)
Ln (Issue Size)	-0.6843***	-0.6848***	-0.6920***	-0.6749***	-0.7636***	-0.7608***	-0.7839***	-0.7818***
	(-4.71)	(-4.71)	(-4.67)	(-4.50)	(-14.24)	(-14.14)	(-14.42)	(-14.27)
Coupon	-0.1670**	-0.1698**	-0.1683**	-0.1765**	0.0978***	0.0997***	0.0956***	0.1024***
	(-2.33)	(-2.33)	(-2.36)	(-2.41)	(3.65)	(3.72)	(3.59)	(3.81)
Bond Rating	0.0107	0.0106	0.0129	0.0132	0.0083	0.0071	0.0065	0.0059
	(0.62)	(0.61)	(0.75)	(0.75)	(1.43)	(1.22)	(1.11)	(1.01)
Bookrunners	0.0088	0.0099	0.0087	0.0085	0.0099	0.0099	0.0100	0.0096
	(0.26)	(0.29)	(0.27)	(0.25)	(0.83)	(0.83)	(0.85)	(0.81)
Total Assets	-0.0283	-0.0299	-0.0293	-0.0293	-0.0291*	-0.0259	-0.0371**	-0.0369**
	(-0.87)	(-0.91)	(-0.90)	(-0.87)	(-1.82)	(-1.62)	(-2.24)	(-2.19)
ROA	0.0016	0.0042	0.0042	0.0024	0.0287***	0.0279***	0.0286***	0.0263***
	(0.13)	(0.34)	(0.33)	(0.19)	(3.78)	(3.65)	(3.79)	(3.45)
Leverage	0.0133	0.0133	0.0132	0.0134	-0.0024	-0.0018	-0.0021	-0.0013
	(0.39)	(0.39)	(0.39)	(0.39)	(-0.43)	(-0.33)	(-0.36)	(-0.21)
Flight to Safety	-0.1777	-0.1831	-0.2041*	-0.1768	0.1262**	0.1281**	0.1230**	0.1304**
	(-1.49)	(-1.53)	(-1.73)	(-1.47)	(2.16)	(2.18)	(2.13)	(2.22)
Flight to Quality	0.0662	0.0599	0.0583	0.0677	0.0871*	0.0890*	0.0806	0.0905*
	(0.63)	(0.57)	(0.56)	(0.64)	(1.73)	(1.77)	(1.60)	(1.79)
GDP Growth	-1.3575	-1.4959	-1.8305	-1.3072	-0.5387	-0.6237	-0.4683	-0.5978
	(-0.93)	(-1.03)	(-1.25)	(-0.90)	(-0.90)	(-1.04)	(-0.79)	(-1.00)

Constant	9.3352***	9.3457***	9.3325***	9.3894***	8.2678***	8.2313***	8.0987***	8.1322***
	(10.02)	(9.94)	(10.08)	(10.00)	(19.14)	(18.99)	(18.83)	(18.66)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1131	1131	1149	1131	7084	7084	7115	7084
Adjusted R2	0.1658	0.1626	0.1654	0.1648	0.2603	0.2605	0.2613	0.2614

The table presents the comparative analysis results of analyst' impacts on green bonds and non-green bonds' demands. The dependent variable is *Oversubscription.* Models 1–4 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for green bonds. Models 5–8 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for non-green bonds. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Bond demand and systematic risks

	High beta				Low beta			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	0.9930***			0.8625***	0.1546			0.0979
	(3.92)			(3.24)	(0.27)			(0.17)
Forecast Dispersion		-4.3222*		-1.6819		-3.0465		-2.8712
		(-1.90)		(-0.74)		(-0.44)		(-0.41)
Coverage			0.2268***	0.2081**			0.0928	0.0733
			(2.65)	(2.34)			(1.14)	(0.87)
Ln (Issue Size)	-0.7851***	-0.7851***	-0.8111***	-0.8126***	-0.7589***	-0.7565***	-0.7845***	-0.7709***
	(-11.01)	(-10.97)	(-11.13)	(-11.08)	(-9.79)	(-9.73)	(-9.91)	(-9.69)
Coupon	0.0321	0.0324	0.0311	0.0389	0.1274***	0.1288***	0.1292***	0.1310***
	(1.05)	(1.06)	(1.02)	(1.26)	(2.90)	(2.91)	(2.96)	(2.95)
Bond Rating	0.0054	0.0042	0.0026	0.0025	0.0144	0.0142	0.0130	0.0133
	(0.73)	(0.58)	(0.35)	(0.33)	(1.51)	(1.49)	(1.40)	(1.42)
Bookrunners	0.0176	0.0174	0.0173	0.0162	0.0070	0.0070	0.0064	0.0069
	(0.99)	(0.98)	(0.97)	(0.91)	(0.43)	(0.43)	(0.40)	(0.42)
Total Assets	-0.0436**	-0.0415**	-0.0574***	-0.0561***	-0.0081	-0.0073	-0.0092	-0.0128
	(-2.46)	(-2.33)	(-3.11)	(-3.02)	(-0.35)	(-0.31)	(-0.39)	(-0.52)
ROA	0.0228***	0.0236***	0.0234***	0.0212**	0.0230**	0.0226**	0.0222**	0.0215*
	(2.61)	(2.68)	(2.71)	(2.43)	(2.11)	(2.05)	(2.05)	(1.96)
Leverage	-0.0105	-0.0102	-0.0116	-0.0099	-0.0016	-0.0015	-0.0012	-0.0013
	(-0.88)	(-0.83)	(-0.95)	(-0.82)	(-0.21)	(-0.21)	(-0.16)	(-0.17)
Flight to Safety	0.1338*	0.1321*	0.1262*	0.1356*	0.0326	0.0335	0.0114	0.0322
	(1.83)	(1.79)	(1.71)	(1.84)	(0.40)	(0.41)	(0.14)	(0.39)
Flight to Quality	-0.0698	-0.0706	-0.0793	-0.0700	0.2121***	0.2130***	0.2047***	0.2121***
	(-1.11)	(-1.12)	(-1.26)	(-1.12)	(3.13)	(3.14)	(3.01)	(3.12)
GDP Growth	0.0771	-0.0077	0.0861	0.0611	-0.9939	-1.0185	-0.9674	-0.9976
	(0.12)	(-0.01)	(0.13)	(0.09)	(-0.92)	(-0.94)	(-0.89)	(-0.92)

Constant	8.8334***	8.8173***	8.5677***	8.6441***	7.9581***	7.9421***	7.8992***	7.9297***
	(15.98)	(15.89)	(15.53)	(15.55)	(13.16)	(13.10)	(13.14)	(13.04)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,234	4,234	4,249	4,234	3,985	3,985	4,011	3,985
Adjusted R2	0.3130	0.3120	0.3123	0.3144	0.2158	0.2158	0.2159	0.2157

This table shows the results of analyst' impacts on bond demand of firms divided in subsamples based on the firms' information environment proxied by market beta. The dependent variable is *Oversubscription*. Models 1–4 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with high beta. Models 5–8 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with low beta. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Bond demand and stock volatility

	High volatility				Low volatility			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	0.5942**			0.4685*	3.3134			2.6467
	(2.27)			(1.67)	(1.61)			(1.22)
Forecast Dispersion		-2.8851		-1.4046		-10.6203		-6.7890
		(-1.35)		(-0.63)		(-1.53)		(-0.99)
Coverage			0.2746***	0.2575***			0.0262	0.0192
			(3.71)	(3.29)			(0.27)	(0.19)
Ln (Issue Size)	-0.8707***	-0.8690***	-0.9098***	-0.9089***	-0.7169***	-0.7145***	-0.7244***	-0.7178***
	(-12.82)	(-12.79)	(-13.26)	(-13.17)	(-8.88)	(-8.76)	(-8.70)	(-8.65)
Coupon	-0.0084	-0.0083	-0.0083	0.0001	0.1545***	0.1529***	0.1497***	0.1560***
	(-0.26)	(-0.25)	(-0.26)	(0.00)	(3.74)	(3.69)	(3.61)	(3.78)
Bond Rating	0.0018	0.0007	-0.0014	-0.0023	0.0146	0.0138	0.0140	0.0142
	(0.23)	(0.09)	(-0.19)	(-0.29)	(1.64)	(1.55)	(1.57)	(1.59)
Bookrunners	0.0070	0.0076	0.0073	0.0068	0.0111	0.0099	0.0108	0.0101
	(0.46)	(0.49)	(0.48)	(0.44)	(0.56)	(0.49)	(0.55)	(0.50)
Total Assets	-0.0169	-0.0148	-0.0347**	-0.0324*	-0.0486*	-0.0450*	-0.0505*	-0.0469*
	(-0.99)	(-0.86)	(-1.96)	(-1.82)	(-1.85)	(-1.69)	(-1.89)	(-1.69)
ROA	0.0242***	0.0249***	0.0245***	0.0232***	0.0269**	0.0266**	0.0290**	0.0254**
	(2.93)	(3.03)	(3.00)	(2.83)	(2.23)	(2.14)	(2.41)	(2.06)
Leverage	-0.0122*	-0.0120*	-0.0130*	-0.0122*	0.0087	0.0084	0.0090	0.0085
	(-1.77)	(-1.72)	(-1.81)	(-1.69)	(0.75)	(0.73)	(0.78)	(0.73)
Flight to Safety	0.0578	0.0533	0.0412	0.0541	0.1427	0.1482	0.1474	0.1452
	(0.86)	(0.79)	(0.62)	(0.80)	(1.41)	(1.46)	(1.46)	(1.44)
Flight to Quality	-0.0011	-0.0003	-0.0101	-0.0067	0.1642**	0.1669**	0.1605**	0.1666**
	(-0.02)	(-0.00)	(-0.16)	(-0.10)	(2.31)	(2.33)	(2.25)	(2.33)

GDP Growth	-0.2437	-0.3486	-0.2542	-0.2218	-0.1487	-0.2327	-0.1361	-0.2062
	(-0.34)	(-0.49)	(-0.36)	(-0.31)	(-0.15)	(-0.24)	(-0.14)	(-0.21)
Constant	9.1950***	9.1638***	8.9588***	8.9772***	8.1995***	8.1469***	8.1758***	8.1536***
	(18.09)	(18.00)	(17.58)	(17.47)	(12.47)	(12.24)	(12.51)	(12.30)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,957	3,957	3,978	3,957	4,086	4,086	4,093	4,086
Adjusted R2	0.2972	0.2964	0.2984	0.2999	0.2346	0.2343	0.2336	0.2344

This table shows the results of analyst' impacts on bond demand of firms divided in subsamples based on the firms' information environment proxied by stock volatility. The dependent variable is *Oversubscription*. Models 1–4 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with high volatility. Models 5–8 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with low volatility. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Bond demand and business risks

	High business risks				Low business risks			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	1.1952***			1.0227***	-0.2313			-0.4774
	(5.19)			(4.45)	(-0.54)			(-1.28)
Forecast Dispersion		-6.7617		-2.9084		-3.6101		-4.2589*
		(-1.59)		(-0.70)		(-1.59)		(-1.76)
Coverage			0.3015***	0.2642***			-0.1268	-0.1423
			(3.38)	(2.92)			(-1.54)	(-1.64)
Ln (Issue Size)	-0.8916***	-0.8912***	-0.9304***	-0.9249***	-0.6949***	-0.6927***	-0.6636***	-0.6682***
	(-11.50)	(-11.40)	(-11.83)	(-11.68)	(-10.40)	(-10.37)	(-9.71)	(-9.74)
Coupon	0.0508	0.0523	0.0404	0.0558	0.0634**	0.0670**	0.0619**	0.0634**
	(1.21)	(1.22)	(0.97)	(1.31)	(1.98)	(2.10)	(1.97)	(2.00)
Bond Rating	-0.0069	-0.0096	-0.0113	-0.0117	0.0144**	0.0136**	0.0146**	0.0143**
	(-0.53)	(-0.73)	(-0.88)	(-0.90)	(2.50)	(2.37)	(2.56)	(2.50)
Bookrunners	0.0229	0.0228	0.0205	0.0225	-0.0041	-0.0042	-0.0012	-0.0031
	(1.35)	(1.34)	(1.21)	(1.31)	(-0.26)	(-0.27)	(-0.08)	(-0.20)
Total Assets	-0.0518*	-0.0452	-0.0723**	-0.0713**	-0.0111	-0.0095	0.0000	0.0026
	(-1.76)	(-1.53)	(-2.30)	(-2.24)	(-0.61)	(-0.52)	(0.00)	(0.14)
ROA	0.0212**	0.0214**	0.0215**	0.0184*	0.0395**	0.0375**	0.0414**	0.0411**
	(2.05)	(2.02)	(2.07)	(1.74)	(2.16)	(2.06)	(2.25)	(2.24)
Leverage	-0.1734	-0.2107	-0.2060	-0.1557	-0.1700	-0.1476	-0.2576	-0.2082
	(-0.64)	(-0.78)	(-0.76)	(-0.57)	(-0.76)	(-0.66)	(-1.14)	(-0.92)
Flight to Safety	-0.0011	-0.0028	-0.0019	-0.0104	0.1303*	0.1361**	0.1247*	0.1320**
	(-0.01)	(-0.03)	(-0.02)	(-0.12)	(1.96)	(2.04)	(1.90)	(1.98)
Flight to Quality	0.0871	0.0860	0.0814	0.0768	0.0020	0.0073	-0.0049	0.0042
	(1.28)	(1.26)	(1.19)	(1.12)	(0.03)	(0.12)	(-0.09)	(0.07)

GDP Growth	-1.4674	-1.5230	-1.4436	-1.3406	0.5194	0.4355	0.4961	0.4289
	(-1.19)	(-1.24)	(-1.17)	(-1.09)	(0.91)	(0.76)	(0.87)	(0.75)
Constant	10.2983***	10.2362***	10.0611***	10.1319***	7.3172***	7.3026***	7.2942***	7.3402***
	(15.86)	(15.59)	(15.48)	(15.43)	(13.83)	(13.79)	(13.79)	(13.81)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,145	4,145	4,157	4,145	4,012	4,012	4,040	4,012
Adjusted R2	0.1810	0.1789	0.1804	0.1837	0.3187	0.3191	0.3201	0.3198

This table shows the results of analyst' impacts on bond demand of firms divided in subsamples based on the firms' information environment proxied by business risks. The dependent variable is *Oversubscription*. Models 1–4 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with high business risks. Models 5–8 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with low business risks. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11: Bond demand and ESG performance

	High ESG				Low ESG			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	1.6505**			1.4839**	0.8119***			0.7771***
	(2.58)			(2.24)	(4.01)			(3.95)
Forecast Dispersion		-5.8505		-2.3692		-2.4031		0.3481
		(-1.33)		(-0.52)		(-0.65)		(0.10)
Coverage			0.0015	0.0017			0.2178**	0.2008**
			(0.01)	(0.01)			(2.27)	(2.07)
Ln (Issue Size)	-0.6840***	-0.6863***	-0.6896***	-0.6832***	-0.7697***	-0.7708***	-0.7940***	-0.7896***
	(-7.91)	(-7.87)	(-7.93)	(-7.84)	(-9.97)	(-9.97)	(-10.31)	(-10.22)
Coupon	0.1972***	0.1953***	0.1933***	0.1977***	-0.0170	-0.0160	-0.0171	-0.0167
	(4.78)	(4.68)	(4.66)	(4.77)	(-0.42)	(-0.39)	(-0.42)	(-0.41)
Bond Rating	0.0068	0.0068	0.0084	0.0063	0.0160	0.0151	0.0157	0.0158
	(0.72)	(0.74)	(0.90)	(0.68)	(1.54)	(1.45)	(1.52)	(1.53)
Bookrunners	-0.0077	-0.0093	-0.0089	-0.0080	0.0278	0.0285	0.0261	0.0249
	(-0.41)	(-0.49)	(-0.48)	(-0.43)	(1.41)	(1.44)	(1.32)	(1.26)
Total Assets	-0.1907***	-0.1857***	-0.1931***	-0.1883***	-0.0145	-0.0107	-0.0470	-0.0463
	(-4.16)	(-4.03)	(-3.60)	(-3.51)	(-0.38)	(-0.28)	(-1.12)	(-1.09)
ROA	0.0148	0.0150	0.0172*	0.0142	0.0311***	0.0327***	0.0292***	0.0276**
	(1.48)	(1.47)	(1.66)	(1.34)	(2.87)	(3.02)	(2.73)	(2.56)
Leverage	-0.7959**	-0.8294**	-0.8340**	-0.7974**	0.0121	-0.0060	0.0103	0.0403
	(-2.34)	(-2.44)	(-2.45)	(-2.34)	(0.04)	(-0.02)	(0.04)	(0.15)
Flight to Safety	0.1085	0.1084	0.1017	0.1106	0.0336	0.0343	0.0208	0.0308
	(1.23)	(1.23)	(1.16)	(1.25)	(0.40)	(0.40)	(0.25)	(0.36)
Flight to Quality	0.0315	0.0331	0.0308	0.0324	0.1348**	0.1341**	0.1236*	0.1286*
	(0.42)	(0.44)	(0.41)	(0.43)	(2.02)	(2.01)	(1.85)	(1.94)
GDP Growth	-0.3171	-0.4606	-0.3528	-0.3636	-1.0938	-1.1719	-1.1325	-1.1057
	(-0.34)	(-0.49)	(-0.38)	(-0.38)	(-1.20)	(-1.28)	(-1.23)	(-1.20)

Constant	11.0863***	11.0406***	11.1340***	11.0526***	8.2871***	8.2273***	8.4107***	8.4279***
	(11.95)	(11.75)	(12.02)	(11.90)	(10.98)	(10.87)	(11.17)	(11.10)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,579	3,579	3,579	3,579	3,534	3,534	3,542	3,534
Adjusted R2	0.2722	0.2714	0.2709	0.2719	0.2373	0.2360	0.2373	0.2386

This table shows the results of analyst' impacts on bond demand of firms divided in subsamples based on the firm environmental risks proxied by ESG performance. The dependent variable is *Oversubscription*. Models 1–4 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with high ESG. Models 5–8 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with low ESG. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 12: Bond demand and carbon emission

	High emission				Low emission			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forecast Accuracy	1.9768*			0.8155	1.1382			1.3027
	(1.80)			(0.86)	(1.40)			(1.46)
Forecast Dispersion		-16.2182***		-14.0937**		-0.3682		2.4463
		(-2.79)		(-2.45)		(-0.06)		(0.34)
Coverage			0.4821***	0.4787***			0.2906**	0.2761*
			(3.19)	(3.22)			(2.03)	(1.90)
Ln (Issue Size)	-0.9331***	-0.9265***	-0.9521***	-0.9468***	-0.6409***	-0.6481***	-0.6628***	-0.6526***
	(-10.02)	(-9.88)	(-10.24)	(-10.14)	(-6.37)	(-6.43)	(-6.50)	(-6.41)
Coupon	0.1282***	0.1412***	0.1201**	0.1390***	0.1593***	0.1539***	0.1563***	0.1610***
	(2.67)	(2.93)	(2.48)	(2.87)	(3.44)	(3.32)	(3.40)	(3.47)
Bond Rating	0.0143	0.0123	0.0138	0.0104	0.0142	0.0147	0.0145	0.0143
	(1.06)	(0.91)	(1.02)	(0.77)	(1.33)	(1.40)	(1.36)	(1.35)
Bookrunners	0.0088	0.0093	0.0097	0.0102	-0.0272	-0.0278	-0.0270	-0.0265
	(0.44)	(0.46)	(0.49)	(0.51)	(-1.24)	(-1.26)	(-1.21)	(-1.18)
Total Assets	-0.0864*	-0.0804*	-0.1691***	-0.1575***	-0.0751*	-0.0721*	-0.1166**	-0.1207**
	(-1.77)	(-1.66)	(-3.04)	(-2.84)	(-1.88)	(-1.76)	(-2.43)	(-2.48)
ROA	0.0243*	0.0220*	0.0149	0.0108	0.0328***	0.0348***	0.0313***	0.0297***
	(1.92)	(1.72)	(1.14)	(0.82)	(2.88)	(2.99)	(2.88)	(2.63)
Leverage	-0.3088	-0.3218	-0.2430	-0.2170	-0.7669**	-0.7652**	-0.7015**	-0.7062**
	(-0.79)	(-0.82)	(-0.62)	(-0.56)	(-2.16)	(-2.15)	(-2.00)	(-2.01)
Flight to Safety	0.0727	0.0846	0.0776	0.0807	0.5068***	0.5065***	0.5134***	0.5120***
	(0.64)	(0.75)	(0.69)	(0.72)	(3.30)	(3.30)	(3.35)	(3.33)
Flight to Quality	0.2646**	0.2725**	0.2650**	0.2803**	-0.0127	-0.0099	0.0041	-0.0023
	(2.23)	(2.29)	(2.20)	(2.35)	(-0.12)	(-0.09)	(0.04)	(-0.02)
GDP Growth	-0.4342	-0.6126	-0.3692	-0.6133	-1.9702*	-1.9437*	-1.9051*	-1.8927
	(-0.29)	(-0.41)	(-0.24)	(-0.41)	(-1.75)	(-1.70)	(-1.69)	(-1.64)

Constant	10.6200***	10.5437***	10.7851***	10.6609***	8.3691***	8.3368***	8.3664***	8.4311***
	(12.06)	(11.98)	(12.31)	(12.19)	(9.10)	(8.98)	(9.00)	(9.02)
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity Bucket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,653	2,653	2,653	2,653	2,622	2,622	2,625	2,622
Adjusted R2	0.2187	0.2201	0.2224	0.2249	0.2902	0.2897	0.2915	0.2918

This table shows the results of analyst' impacts on bond demand of firms divided in subsamples based on the firm environmental risks proxied by carbon emission. The dependent variable is *Oversubscription*. Models 1–4 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with high ESG. Models 5–8 provides the regression results of *Forecast Accuracy*, *Forecast Dispersion*, and *Coverage* on investor demand for bonds issued by firms with low ESG. In each model, we include a series of bond, firm, and country characteristics as controls. At bond level, we control for issue amount (*Ln (Issue Size)*), *Coupon*, S&P credit rating (*Bond Rating*), and number of bookrunners (*Bookrunners*). At firm level, we control for firm size (*Ln (Total Assets)*), firm profitability (*ROA*), and financial leverage (*Leverage*). At country level, we control for nominal GDP growth (*GDP Growth*), and control for the effects of *Flight to Safety* and *Flight to Quality*. All variables are defined in the Appendix A. All models also control Country x Industry effects, Year effects, Currency effects, and Maturity Bucket effects. Robust standard errors are in parentheses to obtain unbiased estimates of OLS coefficients under heteroscedasticity. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.