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# Determinants of Reputable Underwriters in Green Bond Offering

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**Abstract**

This research paper delves into the process by which industrial companies issuing green bonds can secure certification from reputable underwriters. By analyzing data from international green corporate bond offerings from the period between 2014 and 2022, the study aims to unravel the factors that influence underwriter selection decisions. Using a logit model to address the potential biases, the research reveals specific firm and bond characteristics that significantly impact the likelihood of collaborating with reputable underwriters. The findings indicate that reputable underwriters exhibit a preference for larger firms demonstrating strong financial performance, dealing with larger bond sizes, and possessing distinct bond features such as callability and involvement in private placements. Additionally, variables like maturity periods, involvement in finance vehicles, credit ratings, and syndicate size emerge as crucial factors in underwriter selection processes. These insights highlight the critical factors that issuers must thoroughly assess when selecting underwriters with strong reputations. The significance role of underwriter credibility, capabilities, and reliability in shaping the landscape of green bond underwriting is emphasized. This analysis holds relevance for both academic research and industry practitioners within the realm of sustainable finance.

**Keywords**: reputable underwriters, cross-border green bond issuance, logit model, issuer-underwriters matching, firm and bond characteristics.

## I. INTRODUCTION AND BACKGROUND

The importance of hiring reputable underwriters in capital raising is highlighted in influential theoretical articles (Leland & Pyle, 1977; Booth & Smith, 1985; Johnson & Miller, 1988; Carter & Manaster 1990; Megginson & Weiss, 1991; Chemmanur & Fulghieri, 1994; Fang, 2005; Carbó-Valverde et al., 2017; and Carbó-Valverde et al., 2021), which argue that the reputation of financial intermediaries can more effectively address asymmetric information problems between issuers and investors. The advantages of corporate firms hiring reputable underwriter can determine the optimum outcome of securities issuance that can only be accessed through prestigious underwriter. This is because a reputable underwriter provides high-quality external certification. Since their initial releases, green bonds have been well-known among investors for their

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sustainability, efficiency, and bond-level liquidity. Strong demand has been sparked, especially due to their favourable effects on sustainable investments. Corporate green bonds are being used in real-world scenarios, yet there is less knowledge about this innovative financial instrument. Given the constraints on investment possibilities imposed by the requirement that earnings from green bonds be utilized for green projects, issuers should hire reputable underwriters to successfully raise money from potential investors.

Furthermore, a growing number of previous studies have investigated the issuer-underwriter reputational matching and non-financial deals, the evidence is primarily limited to initial public offering (IPOs) and mergers and acquisitions (M&As) deals that were issued in the capital markets. These studies include Beatty and Ritter (1985), Johnson and Miller (1988), Carter and Manaster (1990), Carter and Dark (1993), Chemmanur and Fulghieri (1994), Hunter and Jagtiani (1996), Servaes and Zenner (1996), Carter et al. (1998), Chemmanur and Krishnan (2012), and Neupane and Thapa (2012), and among others. Moreover, Schadler and Manuel (1994), Fang (2005), and Loureiro (2010), are a few examples research that is looking into the reputational matching of issuers and underwriters utilising other types of corporate bonds. However, to the best of my knowledge, the study of the investment bank reputation is not addressed in the cross border green bond offerings. The major goal of this research is to identify the key elements that cross-border green bond issuers need to effectively match with a reliable underwriter. In particular, this research looks at the characteristics of the bond and the business that are linked to reliable underwriters.

More precisely, this research discovers that there are several factors that impact the possibility of an issuer being paired with a trustworthy underwriter for green bond issues. We find that reputable underwriters favor bigger enterprises with a track record of sound financial management. These companies are capable of handling larger bond sizes and have distinctive bond features such as callability and involvement in private placements. Furthermore, characteristics like as credit ratings, syndicate size, activity in financing vehicles, and maturity lengths show up as key considerations in underwriter selection methods. In addition, the results also reveal that issuer would also want to cooperate with reputed underwriter, which show that reputation is very essential. This outcome is in line with Chemmanur and Krishnan (2012), Neupane and Thapa (2013) and Carbó-Valverde et al. (2017) as they discussed about the relevance of underwriter's reputation in IPO's and M&A's deals. By offering insights into the variables influencing the selection of underwriters for bond issuance, this study helps international issuers looking for reliable underwriters. The findings emphasize crucial variables that impact the probability of matching with a reputable underwriter, giving significant knowledge for issuers in their strategic decision-making process. By recognizing these qualities, issuers may maximize their underwriter selection, enhancing the credibility and success of their bond issuance.

## II. LITERATURE REVIEW

### 2.1. Theory on Investment Bank Reputation

The certification role of underwriters in the financial markets is the main emphasis of underwriter theory. Historically, underwriters have served as certifiers, using their reputation to mitigate the information asymmetry between issuers and investors, as posited by the information asymmetry theory (Diamond, 1984; de Oliveira et al., 2023). Reputable underwriters are crucial for attracting investors, signaling the quality of offerings, and ensuring the success of debt issuances. Their reputation acts as a market signal, influencing investors' opinions and assessments. Underwriters are associated with less risky issuances because they have a stake in maintaining their reputation (Carter and Manaster, 1990; de Oliveira et al., 2023).

Additionally, agency theory suggests that the reputation of the underwriter can mitigate agency problems between the issuer and investors. Reputable underwriters act as intermediaries who align the interests of the issuer and investors (de Oliveira et al., 2023; Cliff & Denis, 2004). However, recent studies cast doubt on the conventional certification approach, arguing that reputation may not always be sufficient to ensure underwriting quality or avoid defaults. Underwriter success is also influenced by factors such as long-term client connections, distribution networks, and the underwriter's capacity to deliver efficient monitoring services (Yasuda, 2005; Chemmanur & Krishnan, 2008; Andres et al., 2014; and Carbó-Valverde et al., 2021).

There is variability in the efficacy of reputation-based discipline systems in mergers and acquisitions, with inconsistent findings across studies (McLaughlin, 1992; Servaes & Zenner, 1996; Hunter & Jagtiani, 2003; and Gopalan et al., 2011). Although reputation is still significant in the financial markets, traditional explanations may not necessarily explain how it affects underwriting quality and monitoring initiatives.

### 2.2. Measuring Underwriter's Reputation

Three different authors, spanning multiple years, have discussed three distinct approaches for assessing an underwriter's reputation. By incorporating a range of time frames, a more comprehensive and accurate evaluation of the underwriter's reputation can be achieved.

#### 2.2.1. Carter and Manaster (1990)

Carter and Manaster (1990) analyzed initial equity offerings from January 1, 1979, to August 17, 1983, using "tombstone" announcements that indicate the rankings of underwriters in these offerings. Tombstone announcements, published in investment dealer's digest and the wall street journal, serve as notifications for upcoming public security offerings. The researchers developed a ranking scale by reviewing these announcements and assigning scores from 0 (least prestigious) to 9 (most prestigious) to each underwriter based on their placement.

This ranking process involves systematically evaluating each announcement to determine the relative prestige of underwriters, resulting in a score that reflects their reputation. Notably, no company has achieved a rank higher than nine, and those ranked zero were not elevated above others. Consequently, the tombstone announcements provide a framework for assessing underwriter reputation, though compiling the Carter-Manaster measure is a labor-intensive task due to the detailed analysis required to rank each underwriter accurately.

#### 2.2.2. Johnson and Miller (1988)

The measures developed by Johnson and Miller (1988) and Megginson and Weiss (1991) are easier to implement than the Carter and Manaster approach, they utilize the approach developed by Carter and Manaster and altered it. Johnson and Miller categorize underwriters into three groups with corresponding star ratings: "bulge bracket" firms receive three stars (the highest), "major bracket" firms get two stars, and "sub-major bracket" firms are assigned one star.

Since the Securities Act of 1933, the "bulge bracket" includes prominent investment banks like Morgan Stanley and First Boston, as well as newer firms like Salomon Brothers. The "major bracket" consists of firms such as Lazard Freres and Kidder, Peabody, which, while having smaller underwriting shares than bulge bracket firms, still wield considerable influence on Wall Street. Lastly, the "sub-major" group includes firms vying for a spot in the major bracket, typically receiving a significant portion of offerings despite having smaller average underwriting shares. Many of these firms, like Bear Stearns, are known for their retail distribution services.

#### 2.2.3. Megginson and Weiss (1991)

When it comes to Megginson and Weiss (1991), they use the relative market share of the underwriter as a proxy for their reputation. They determine an underwriter's reputation based on their market share, which is the percentage of the total dollar amount of securities that were brought to market by that underwriter during the sample period. They found a significant correlation between their measurement and the rankings developed by Carter and Manaster. The disparity between them may be attributable to the measurement contrast, even though Carter and Manaster, in addition to their proxies, are related with one another. Their proxy places an emphasis on the relative market share of the underwriter. On the other hand, the measurement provided by the Carter Manaster considers the volume of business an underwriter maintains.

Even if an investment bank is in the lead position in a considerable number of offerings, it will not receive a high Carter Manaster rating if its name appears in tombstone advertisements alongside lower-ranked underwriters. They argue that Carter and Manaster's method of measuring the reputation of underwriter is inappropriate for two different reasons. To begin, Megginson and Weiss (1991) state that the Carter and Manaster rankings only evaluate the underwriter reputation from 1979 to 1983. If one uses the Carter and Manaster rankings, one is required to make the strong presumption that the underwriter reputation does not change over time. Because of this, they argue that their reputation metric, which is determined by market share, is of greater significance than the ordinal values that are determined by the Carter and Manaster rankings.

To summarize, the measurement of the underwriter's reputation was initially determined by looking at the 'tombstone' statement, which is also known as a ranking system. This announcement was made when a public security offering was carried out. The reputation of each underwriter will be displayed based on the ranking system, and clients will be able to utilize this information to determine which investment bank to work with. The result is a score that can range from 0 (the least prestigious) to 9 (the most prestigious). Aside from that, the underwriter's reputation was broken down into three other areas. In this system, underwriting companies that fall into the "bulge bracket" are given a rating of three stars, which is the highest possible score; companies that fall into the "major bracket" receive a rating of two stars; and companies that fall into the "sub major bracket" receive a rating of one star. And finally, market share, which is the proportion of the total dollar amount of securities that were brought to market by each underwriter throughout the sample period, was recently utilized as a method to assess the underwriter's reputation. This method was developed very recently.

### 2.3. The Determinants of Reputable Underwriter

#### 2.3.1. Bond-specific characteristics

Several studies have found that well-known banks are better equipped to handle the complexities of sophisticated security design. Issuers often select reputable underwriters with proven track records and sophisticated capabilities, recognizing the value of maintaining a strong reputation (Corwin & Schultz, 2005; Fang, 2005; Chemmanur & Krishnan, 2012; Neupane & Thapa, 2013; Andres et al., 2014; and Carbó-Valverde et al., 2017). The placement complexity increases with bond size, as underwriters must invest more effort in promoting, pricing, and selling. Larger issues are more likely to be placed by reputable underwriters, and their reputation is crucial in lowering the cost of bonds (Carbó-Valverde et al., 2017; Chen et al., 2018). Reputable underwriters are more willing to manage convertible bond issuance for larger companies with greater financial slack, faster stock run-up, and lower stock return volatility (Ling, 2020).

Maturity is another factor that increases the complexity of bond placement. Bonds with larger amounts and longer maturities are regarded as more difficult to underwrite, and reputable underwriters are more likely to be chosen for these deals (Fang, 2005; Carbó-Valverde et al., 2017; and Nielsen et al., 2021). The marginal effect of maturity on likelihood is approximately 1.15 times larger for banks than for non-financial companies. The inclusion of call options also influences the selection of reputable underwriters. Call provisions increase the likelihood of a reputable bank being chosen, as they can provide superior pricing and risk management services, enhancing financial flexibility for issuers (Livingston & Miller, 2000; Fang, 2005; Griffin et al., 2014; Carbó-Valverde et al., 2017; and Jameson et al., 2021).

**2.3.2. Firm-specific characteristics**

Reputable underwriters tend to favor larger corporations for convertible bond offerings due to their perceived lower risk, which helps maintain the underwriters' prestigious status (Fang, 2005; Ling, 2020). Larger and more profitable firms attract esteemed investment banks, leveraging their certification and marketing capabilities. This mutually beneficial relationship enhances the reputation of both parties (Jo, ferH et al., 2007). Reputable underwriters influence post-issue returns and are associated with higher net proceeds, providing significant advantages to issuer firms (Fernando et al., 2005). However, they are cautious about underwriting high-leverage companies due to increased credit risk and potential damage to their reputation (Lou & Vasvari, 2013). Volatile stock returns also deter underwriters, as they indicate financial instability (Chang et al., 2004).

The prestige of an underwriting firm correlates with its ability to form larger syndicates, which improves information processing and risk distribution during economic downturns (Corwin & Schultz, 2005; Carbó-Valverde et al., 2017). Studies show that transactions managed by reputable underwriters perform better long-term (Dong et al., 2011), and investors trust banks with strong track records (Chemmanur & Fulghieri, 1994). Reputation also affects underwriting fees and the pricing of offerings, with reputable underwriters demanding higher fees but providing superior services that lead to lower bond yields and increased issuer proceeds (Fang, 2005; Neupane & Thapa, 2012). However, dominant underwriters may exploit issuers due to reduced vulnerability to reputation damage (Gopalan et al., 2011; Andres et al., 2014).

While research highlights the importance of underwriter reputation in various contexts, there is a gap regarding cross-border green bond offerings. This study aims to explore the factors influencing the selection of reputable underwriters in this market, providing insights for issuers and investors on their significance.

## III. RESEARCH METHODOLOGY

### 3.1. Measuring Underwriter Reputation

There are two primary measures, cardinal and ordinal, used to gauge reputation based on market share. Cardinal method is used to considers the market share as a total market share (Megginson & Weiss, 1991; Gande et al., 1997; Livingston & Miller, 2000; and Iannotta & Navone, 2008). Whereas the ordinal method categorizes underwriters by their market share rank, with the top underwriter considered most trustworthy

(Livingston & Miller, 2000; Fang, 2005; Yasuda, 2005; and Andres et al., 2014). In this study, we employ the ordinal measurement system to assess underwriter reputation, aligning with the market structure where underwriters are seen as heavyweight players or not. Underwriter reputation is constructed based on relative market share, ranking underwriters by gross proceeds raised. The top 15 underwriters are deemed reputable, often part of syndicates, which offer advantages like broader market coverage, enhanced expertise, and improved risk management. Diverse underwriter groups can aid in better pricing and allocation strategies, enhancing the success of green bond issuances.

### 3.2. Datasource and Variable Sample Construction

Data on international green corporate bond offerings from the CBonds database and Refinitiv Datastream LSEG covers the period 2014 to 2022, with 723 samples showcasing various bond characteristics. The dataset includes details like yield, maturity, offer price, coupon, underwriter, and ratings, categorized into issue, issuer, and underwriter characteristics. The study delves into bond-specific, issuer, and underwriter characteristics, providing insights into the factors influencing green bond offerings and underwriting dynamics.

### 3.3. Logit Model

In this research, we employ a binary logistic regression model is employed to explain the probability of being matched with a reputable underwriter based on issuer and bond characteristics. The model incorporates variables describing bond-specific and firm-specific qualities, issuer type, and year dummies to account for shifts in debt financing levels over time. Bond characteristics like issue size, maturity, callable bonds, investment grade, and syndicate size are considered, while firm characteristics such as firm size, debt-to-equity ratio, return on assets, and special purpose company status are included in the analysis. Private placement is also factored in as a dummy variable. This comprehensive approach aims to understand the factors influencing the matching process between issuers and underwriters in green bond offerings.

### 3.4. Robustness Check

Probit model is used to check the robustness of the logit model results. The Probit model is a statistical technique used for regression analysis involving binary outcome variables. In this model, the chance of a binary outcome falling into one of two categories is evaluated based on predictor factors. The choice to use the probit model was based on its strong similarity to the logit model, however it differs in terms of the assumptions made about the distribution. Although there are differences between them, the probit model is recognised for yielding similar outcomes to the logit model when the latter is correctly described. By integrating the probit model into the analysis, the study not only examined the reliability of the findings, but also extensively assessed the accuracy and validity of the outcomes, therefore boosting the overall rigors and credibility of the study.

## IV. RESULTS AND DISCUSSION

### 4.1. Top 15 Underwriter's Reputation

Table 1 provides a comprehensive overview of the top 15 underwriters in the market share of cross border green bond underwriting, using data collected between 2014 and 2022. The total amount, total deals, and market share in amount variables, are provided in the table to shed light on the key underwriters in green bond offerings. The findings contribute to establishing a league table of the top reputable underwriters hired by non-financial firms in issuing cross-border green bond offerings.

To investigate the specifics, "total amount" represents the aggregate corporate bond underwriting proceeds for each bank, measured in millions USD. "Total deals" correspondingly captures the total number of issues underwritten by each bank during the specified time frame.

JP Morgan emerges as the leading reputable underwriter, has provided a remarkable underwriting service amounting to $18,944,292,729 in 203 deals. BofA Securities closely follows with a total amount of $17,391,509,789 and 177 deals, while Citigroup secures the third position with a total amount of $15,679,697,795 and 175 deals. These figures highlight the prominent role of these institutions in the underwriting landscape, particularly in the realm of green bond offerings.

This metric aids in gauging the relative contribution of each institution to the overall market. Notably, JP Morgan, BofA Securities, and Citigroup maintain market shares of 5.75%, 5.28%, and 4.76%, respectively, indicating their significant influence in the cross-border green bond underwriting market. The prominence of these underwriters suggests that they have established a strong presence in facilitating environmentally conscious financial instruments. However, it is important to take note that this league table does not necessarily reflect the "best" underwriters, but rather indicates which firms have the highest market share and are most frequently hired for underwriting services. An underwriter's reputation or quality of work is not diminished by being placed lower on the list—for example, in the 10th or 15th spot—compared to the top three businesses. The league table is meant to provide a snapshot of the most active and reputable underwriters.

Taken together, it is clearly found that most of the corporate firms are more likely to use a reputable underwriter for external certification in cross-border green bond offerings. This suggests that issuers are mostly dependent on reputable underwriter because they have a proven track record in the market, as exemplified by JP Morgan, BofA Securities, and Citigroup, which not only dominate in terms of total underwriting volume and deal count but also possess substantial market shares. These findings highlight the certification capacity of the top underwriters in shaping the landscape of cross-border green bond underwriting, reinforcing the inclination of issuers to engage with reputable underwriters for their green financing needs.

**Table 1**
**Summary Statistics of Top 15 Underwriters**

| Company's Name | Total Amount (USD) | Total Deals | Market Share in Amount |
|---|---|---|---|
| **JP Morgan** | 18,944,292,729 | 203 | 5.75 |
| **BofA Securities** | 17,391,509,789 | 177 | 5.28 |
| **Citigroup** | 15,679,697,795 | 175 | 4.76 |
| **BNP Paribas** | 15,274,017,098 | 174 | 4.63 |
| **HSBC** | 13,408,607,757 | 160 | 4.07 |
| **Barclays** | 12,132,028,721 | 138 | 3.68 |
| **Deutsche Bank** | 11,845,033,633 | 134 | 3.59 |
| **Morgan Stanley** | 11,825,779,461 | 115 | 3.59 |
| **Goldman Sachs** | 9,799,155,582 | 111 | 2.97 |
| **ING Bank** | 7,811,022,203 | 87 | 2.37 |
| **Credit Agricole CIB** | 7,509,756,784 | 89 | 2.28 |
| **Mizuho Financial Group** | 7,071,788,488 | 80 | 2.15 |
| **RBS** | 6,595,917,610 | 74 | 2.00 |

To be continued Table 1

| Company's Name | Total Amount (USD) | Total Deals | Market Share in Amount |
|---|---|---|---|
| **Societe Generale** | 6,451,577,334 | 71 | 1.96 |
| **Banco Santander** | 6,041,062,271 | 71 | 1.83 |

The variable total amount is the total corporate bond underwriting volume for the bank, measured in USD. The variable total deals is the total number of issues underwritten by each bank for the same time period. The market share in amount variable is computed by dividing each underwriter's underwriting volume (amount) by the corresponding market total.

## 4.2. Empirical Results of the Determinants of Reputable Underwriters

The results of our logit regression study of the variables affecting the probability of matching with a reliable underwriter in the context of green bond offerings are shown in Table 2. The results suggest that a 1% increase in issue size is associated with a 5.193% increase in the probability that reputable underwriters will participate in underwriting a cross-border green bond issuance. Reputable underwriters have the resources and skills to manage large transactions, which may explain this results. Other than that, there is a 0.261% increase in the probability that reputable underwriters will participate in underwriting a cross-border green bond issuance associating with 1% increase in maturity, suggesting that reputable underwriters prefer longer maturities. This preference reflects long-term and strong investments. Furthermore, a 1% increase of financial vehicle has greatly increased the likelihood of matching with a reputable underwriter by 7.572%. This finding is in line with Carbó-Valverde et al.'s (2017) notion that assigning the issuance of capital market instruments to a specialized finance vehicle favours respectable matching due to the inherent complexity and sophistication of such arrangements.

Besides that, 1% increase in the callable variable results to a 9.994% rise in the probability of reputable matching. This outcome, like maturity, supports evidence to the claim that respectable underwriters are better able to manage the complexities of callable instruments, particularly in green bond offerings. This suggests issuers favour larger underwriters for more complex agreements (Fang, 2005; Andres, 2014; Carbó-Valverde et al., 2017; and Ling. T. H., 2020). The table also shows that 1% increase in private placement increases reputable matching probability by 5.316%. Bonds under Rule 144A are more likely to be paired with reputable underwriters, as these bonds face less information asymmetries due to tight registration requirements. Moreover, most reputable underwriters are more likely to match with bigger companies as indicated by a 0.534% increase in the odds. This is because well-known underwriters can manage larger, more established companies, as stated by Fang (2005), Carbó-Valverde et al. (2017), and Ling. T. H (2020). Next, a 1% increase in investment grade is associated with a 4.016% increase in the probability that reputable underwriters will participate in underwriting a cross-border green bond issuance, as these underwriters place importance on creditworthiness in such transactions. Finally, every 1% increase in syndicate size enhances the likelihood of matching with reputable underwriters by 0.994%. This suggests that reputable underwriters with larger syndicate sizes often have a broader network of investors, enhancing the distribution of the firm's bonds to a wider range of potential buyers and increasing the likelihood of successful bond sales (Chemmanur & Krishnan, 2008; Andres et al., 2014).

In summary, Table 2 sheds light on the factors influencing the likelihood of matching with a reputable underwriter in the context of green bond offerings. The results reveal that variables such as issue size, longer maturities, finance vehicle involvement, callable securities, private placement, firm size, credit ratings, and syndicate size play significant roles in reputable matching. These results emphasize the strategic considerations issuers make in selecting reputable underwriters, reflecting the importance of underwriter reputation, capabilities, and reliability in shaping the dynamics of green bond underwriting. Therefore, these findings directly address the primary objective of the thesis by identifying the key determinants of achieving a successful green bond underwriter match.

**Table 2**

**Logit Regression Analysis of Matching with a Reputable Underwriter (Coefficients Marginal Effects and Standard Error of Marginal Effects)**

| | Top 15 | |
|---|---|---|
| | **Logit Regression** | **Marginal Effect** |
| **Issue Size** | 1.030*** (0.222) | 5.193** (0.021) |
| **Maturity** | 0.052* (0.029) | 0.261** (0.001) |
| **Finance Vehicle** | 1.502*** (0.553) | 7.572** (0.036) |
| **Callable** | 1.982*** (0.413) | 9.994** (0.036) |
| **Private Placement** | 1.054** (0.525) | 5.316* (0.032) |
| **Firm Size** | 0.106** (0.051) | 0.534* (0.003) |
| **Syndicate Size** | 0.197** (0.077) | 0.994** (0.005) |
| **Investment Grade** | 0.797** (0.379) | 4.016* (0.021) |
| **Year** | Yes | |
| **Firm** | Yes | |
| **Pseudo $R^2$** | 0.5646 | |
| **Observations** | 571 | |

Notes: ***, **, and * indicate statistically significant at 1%, 5%, and 10% significance level respectively.

This table presents the coefficients and the standard errors for the logit regressions for corporate bonds issued Green Bond offering in 2014 to 2022. The dependent variable is a binary variable that takes the value 1 if the bond is placed by top 15 reputable underwriters. Issue size is the sum of relative issue sizes for all issues of a firm during the sample period. The maturity variable is the bond's time to maturity in years. Finance vehicle is a variable is taking the value 1 if the issuer is a finance vehicle company. Callable is a dummy for bonds with a call option. Private placement is the dummy variable of Rule 144A. The firm size variables is the natural logarithm of the issuer's total assets. Investment grade variable is a dummy taking the value 1 for Investment Grade Bonds. Syndicate size reflects the number of deal underwriters.

### 4.3. Robustness Check

Table 4.7 displays the outcomes of a probit regression analysis investigating the determinants affecting the probability of matching with a reputable underwriter. The results suggest that augmenting issue size by 1% increase corresponds to a 6.771% increase in the odds of achieving reputable matching.

Furthermore, extended maturities demonstrate a heightened appeal to reputable underwriters in the probit models, evidenced by a 0.305% surge in the odds of matching for each 1% increase in maturity. The engagement of a finance vehicle substantially amplifies the odds of securing a reputable underwriter match by 9.099%.

Moreover, a 1% rise in the callable variable correlates with a 2.396% escalation in the odds of securing reputable matching. The table also indicates that a 1% increase in private placement results in a 7.222% boost in the odds of reputable matching. Additionally, reputable underwriters exhibit a propensity to consider matches with larger firms, as illustrated by a 0.683% rise in the odds.

Companies with higher ratings, signifying a 1.234% increase in odds, are also more inclined to secure reputable underwriter matches. This inclination aligns with the underwriters' emphasis on creditworthiness in such transactions. Lastly, a larger syndicate size elevates the probability of securing reputable underwriters by 4.983% for every 1% increase in syndicate size.

Although logit model was initially employed for data analysis, I opted to conduct a probit analysis to assess the statistical robustness of the results. The consistent outcomes from both models enhance the reliability of the findings. Furthermore, this consistency reinforces the argument that the identified variables consistently influence the probability of matching with a reputable underwriter, irrespective of the chosen model.

In summary, it can be inferred that the variables considered, namely issue size, maturity, callable, firm size, private placement, finance vehicle, syndicate size, and investment grade, are robust determinants of matching with a reputable underwriter. This conclusion is reinforced by the consistent alignment of findings between probit and logit models, affirming the reliability and validity of the identified characteristics.

**Table 3**

**Probit Regression Analysis of Matching with a Reputable Underwriter (Coefficients Marginal Effects and Standard Error of Marginal Effects)**

| | **Top 15** | |
|---|---|---|
| | **Probit Regression** | **Marginal Effect** |
| **Issue Size** | 0.59*** | 6.771** |
| | (0.11) | (0.022) |
| **Maturity** | 0.03* | 0.305** |
| | (0.01) | (0.001) |
| **Finance Vehicle** | 0.80*** | 9.099** |
| | (0.28) | (0.040) |
| **Callable** | 1.09*** | 2.396*** |
| | (0.22) | (0.035) |
| **Private Placement** | 0.63** | 7.222* |
| | (0.28) | (0.037) |
| **Firm Size** | 0.06** | 0.683** |
| | (0.03) | (0.003) |
| **Syndicate Size** | 0.11*** | 1.234** |
| | (0.04) | (0.005) |
| **Investment Grade** | 0.44** | 4.983** |
| | (0.20) | (0.023) |
| **Year** | Yes | |
| **Firm Cluster** | Yes | |
| **Pseudo $R^2$** | 0.5677 | |
| **Observations** | 571 | |

Notes: ***, **, and * indicate statistically significant at 1%, 5%, and 10% significance level respectively.

This table presents the coefficients and the standard errors for the probit regressions for corporate bonds issued Green Bond offering in 2014 to 2022. The dependent variable is a binary variable that takes the value 1 if the bond is placed by top 15 reputable underwriters. Issue size is the sum of relative issue sizes for all issues of a firm during the sample period. The maturity variable is the bond's time to maturity in years. Finance vehicle is a variable is taking the value 1 if the issuer is a finance vehicle company. Callable is a dummy for bonds with a call option. Private placement is the dummy variable of Rule 144A. The firm size variables is the natural logarithm of the issuer's total assets. Investment grade variable is a dummy taking the value 1 for Investment Grade Bonds. Syndicate size reflects the number of deal underwriters.

## IV. MANAGERIAL IMPLICATIONS AND RECOMMENDATIONS

The study reveals that the determinants of a reputable underwriter fall into two categories: bond-specific and firm-specific characteristics. It indicates that reputable underwriters prefer more complex bonds, such as those with larger issue sizes, finance vehicle involvement, callable securities, longer maturities, investment-grade ratings, larger syndicate sizes, and higher borrower ratings.

According to the findings, several policy implications are suggested to enhance corporate firms' approaches to effectively hiring reputable underwriters. Specifically, issuers should focus on improving their financial performance, maintaining a stable business model, and reducing the likelihood of default to access more complex bond issuance options. This requires solid financial performance, strengthened credit ratings, and strategies to bolster stability and scale. Implementing these policy implications can help establish trust and confidence with underwriters, ultimately leading to successful bond issuances and initiatives that improve the overall efficiency of the underwriting market.

Collectively, this research provides valuable insights for policymakers, regulators, and participants in the financial and underwriting industries who aim to foster a more inclusive and sustainable financial ecosystem. By adopting these strategies, issuers can build trust and confidence with underwriters, enhancing successful bond issuances while providing critical information for those involved in shaping a more equitable and sustainable financial landscape.

Furthermore, the study emphasizes the importance of underwriter credibility, capabilities, and reliability, highlighting their pivotal role in shaping the dynamics of the green bond market. Recognizing the significance of these factors, stakeholders in finance can proactively implement measures to foster transparency, sustainable practices, and financial literacy. This proactive approach is essential for cultivating a more resilient and responsive underwriting environment, thereby contributing to the establishment of a green bond market that aligns with sustainable and ethical principles.

In summary, the study's significant contribution lies in its potential to inform and guide policy and strategic decisions within the finance field. By adopting strategies that enhance trust and confidence with underwriters, issuers can improve their financial performance and access more complex bond issuance options. Ultimately, the insights derived from the study facilitate the adoption of a more dynamic, inclusive, and sustainable approach to green bond underwriting, contributing to the establishment of a green bond market that aligns with broader environmental and social objectives.

In the realm of future research focusing on reputable underwriters underwriting cross-border green bond offerings, there exist several promising avenues warranting exploration. The initial recommendation advocates for a comprehensive examination of how reputable underwriters integrate social and governance aspects into their green bond offerings. This expanded scope goes beyond traditional environmental factors, providing insight into the holistic approach that reputable underwriters employ in their underwriting decisions. An in-depth investigation into how these social and governance dimensions are woven into the underwriting process yields valuable insights into the evolving landscape of sustainable finance and highlights the pivotal role played by reputable companies in shaping it.

Additionally, a critical area deserving attention is the examination of how the participation of reputable financial institutions in green bond underwriting influences their corporate reputation. A thorough exploration of the reputational benefits and risks associated with underwriting green bonds offers a comprehensive understanding of how such engagements mold stakeholder perceptions. This research gains particular relevance in the current landscape where sustainability and environmental considerations significantly influence financial strategies. A robust corporate reputation stands as a valuable asset for financial institutions, and insights into the reputational impact of green bond underwriting are essential for stakeholders, including investors, regulators, and the public. This is especially true as these groups are increasingly conscientious about corporate responsibility and sustainable practices.

Lastly, a compelling area for analysis involves studying green bond underwriting responses to global events. This encompasses an examination of how reputable underwriters react to significant global events, such as climate-related disasters or international policy changes, in their underwriting of green bonds. The research seeks to unravel whether these events influence underwriting strategies, alter risk assessments, and impact the prioritization of specific environmental goals. This suggestion gains relevance because global events, particularly those with environmental implications, can significantly impact the landscape of green finance. Understanding how reputable underwriters adapt their underwriting practices in response to such events provides insights into the adaptability and resilience of sustainable finance strategies. It addresses the dynamic nature of environmental considerations in financial decision-making, offering valuable perspectives for assessing the ability of financial institutions to navigate and contribute to environmental goals amidst evolving global challenges.

## V. CONCLUSION

Utilizing a logit model to account for the endogenous matching between issuers and underwriters, this study examine the probability of aligning with a reputable underwriter and identifying the firm and bond specific determinants that strengthen the possibility of matching with a reputable underwriter. The analysis reveals that reputable underwriters exhibit a pronounced inclination toward larger firms, superior financial performance, substantial bond issues, and specific bond characteristics, including being callable, involvement in private placements, and possessing investment-grade status. These distinctions can be attributed to the reputational capital and expertise held by reputable underwriters, rendering them particularly appealing to larger and financially robust entities. Consequently, this attractiveness results in the underwriting of more expansive and intricate bond offerings.

Moreover, the research reveals distinct patterns that show a preference for callable and investment-grade bonds among reputable underwriters. This alignment can be attributed to their risk preferences and specialized knowledge in these particular types of bonds. Beyond these factors, the research highlights the significance of variables such as issue size, extended maturities, finance vehicle involvement, callable securities, private placements, firm size, credit ratings, and syndicate size in determining the likelihood of matching with reputable underwriters. These findings highlight the key considerations that issuers have to consider when choosing underwriters with strong reputations, highlighting the pivotal role of underwriter credibility, capabilities, and reliability in shaping the dynamics of green bond underwriting.

The findings of this study reveal noteworthy contributions to the green finance field by offering insights that can inform strategic considerations and policy decisions. Having identified the key determinants of hiring a reputable underwriter contributes to a better understanding for corporate firms to secure cross-border green financing.

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