What Determines the Pricing of Yankee Bonds?

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Abstract

The Yankee bond market has emerged as an appealing avenue for foreign firms to raise capital in the U.S. with access to a diverse pool of institutional investors. Based on a comprehensive sample of bonds issued by firms from 105 countries from 1994 to 2022, we demonstrate that institutional demand plays a significant and incremental role in driving Yankee bond yields after controlling for bond characteristics, macroeconomic factors, and country and industry fixed effects. Total, buy, or net trading volume has a significantly negative effect on Yankee bond yield spreads. Robustness checks confirm that the impact is not limited to a particular home country or a specific industry sector, and it remains robust after we exclude crisis periods. The rate-reduction effect can be explained by the credit risk mitigation and liquidity improvement channels. We find the effect to be more pronounced for bonds issued by firms from countries with weaker creditor protection, lower sovereign credit ratings, or less sovereign liquidity. Our results highlight that the institutional demand serves as an important pricing factor for Yankee bonds.

Keywords: Yankee bonds; Institutional investor demand; Trading volume
JEL Classification: G12; G15; G38; K22

I. Introduction

In the global bond markets, foreign bonds represent a unique opportunity for bondholders to invest in local currency-denominated bonds issued by foreign firms. For the U.S. market, these foreign bonds are called Yankee bonds. Unlike other global bonds, Yankee bonds target U.S. investors and are subject to U.S. regulations (Bank for International Settlements, 1992).[1] Through offering Yankee bonds, foreign issuers are provided with access to a large pool of capital and lower borrowing costs in the U.S. market compared to their domestic markets or other international venues. At the same time, the diversity of issuers in the Yankee bond market offers researchers a unique opportunity to investigate the effects of issuer, institutional, and country-specific factors on bond pricing. In 2023, the Yankee bond market experienced significant activity. Notably, in September 2023, European and Asian financial institutions led a surge in issuance, collectively raising approximately $25 billion from the Yankee bond market (Global Capital, 2023). The sustained vigor of the Yankee bond market highlights its critical importance in global financing and underscores the U.S. market's attractiveness to international borrowers.

Much of the existing literature on Yankee bonds focuses on the impact of sovereign-level characteristics on the covenant structure and pricing. For example, Qi et al. (2011) explore how the home country's legal environment affects the covenants included in Yankee bonds. Miller and Reisel (2012) find evidence supporting that financial contracts in Yankee bonds are designed to compensate for weak country-level investor protection. Meng and Yin (2019) examine Yankee bond issuers headquartered in 22 countries and find that a higher level of trust in the issuing firm's country can mitigate investors' concerns about perceived risks. Based on a sample of 934 Yankee bonds from 31 countries, Brockman et al. (2022) document that higher social trust leads to less restrictive covenants in Yankee bonds, reflecting reduced monitoring costs and improved investor confidence in foreign issuers. Miller and Puthenpurachal (2002) use a sample of 260 Yankee bonds and find that investors demand a significant premium on bonds issued by firms from countries with weak investor protection and minimal disclosure requirements. Zhu and Cai (2014) show that greater cultural distance between foreign issuers and investors leads to higher yield spreads on Yankee bonds. Ambrocio et al. (2022) explore the role of political connections in pricing Yankee

[1] Unlike Yankee bonds, Eurobonds are issued outside the jurisdiction of any single country and often in a currency different from the issuer's domestic currency. Yankee bonds are also different from global bonds as global bonds are typically issued in multiple markets worldwide simultaneously.

bonds. They suggest that issuances by firms from countries with close political ties with the U.S. receive better terms in Yankee bond financing.

An important, yet underexplored, question is: Besides the sovereign-level factors, what are the significant drivers that explain the pricing of Yankee bonds? Previous research on institutional price pressure (associated with investor demand) considers how long the effects persist in the equity and bond markets (e.g., Coval and Stafford, 2007; Ellul et al., 2011). Some studies explore whether the pricing impacts are due to price pressure or reflect new information in the U.S. corporate bond market (Ambrose et al., 2012; Denis et al., 2003). Kubitza (2023) examines the effect of investor demand on the financing and investment decisions using bond transactions by U.S. insurance companies. He finds that insurers' persistent investment funded by insurance premiums leads to demand shifts, resulting in higher bond prices and lower yields. The lower cost of financing motivates firms to issue more bonds and use the proceeds for investments rather than shareholder payouts.

Given the dominant role played by institutional investors in the bond markets, we argue that it is critical to examine the effects of institutional investor demand on Yankee bond pricing. Particularly, institutional investors, such as pension funds, insurance companies, and asset managers, operate on a large scale and with a high level of sophistication, often leveraging advanced analytics and significant financial resources in their decision-making. Their transactions, characterized by substantial volume and strategic execution, are likely to play a pivotal role in influencing demand, liquidity, and ultimately the pricing dynamics of Yankee bonds. Understanding this relationship can provide valuable insights into market efficiency and the factors driving the financing costs of foreign issuers in the U.S. market.

In this paper, we analyze the role of institutional investors' demand in determining the pricing of Yankee bonds. Based on a comprehensive dataset spanning 1994 to 2022 and covering issuing firms from 105 countries, this study focuses on the effects of institutional investor demand on the issue yields of Yankee bonds while controlling for bond-specific attributes, macroeconomic factors, and country-level characteristics. Our findings reveal a robust relationship between institutional investor demand and yield spreads on Yankee bonds. Specifically, both total trading volume and net buying volume of institutional trading have a negative and significant effect on Yankee bond yield spreads, reflecting demand-driven pricing dynamics. Economically, a one-percent increase in total trading volume within the 90 days before the origination date is associated

with a reduction of 8.43 basis points in the offering yield. This finding supports our conjecture and underscores the importance of investor demand as a key determinant in bond valuation.

Further investigation suggests that the yield-reduction effect attributed to institutional demand is especially evident for non-UK issuers and non-financial firms. These groups experience substantial pricing advantages. In addition, we examine whether the influence of institutional trading on Yankee bond pricing is influenced by the monetary policy during the crisis periods. The result suggests that institutional trading impacts persist regardless of macroeconomic or regulatory changes. By looking at various time horizons, our analysis indicates that the effect of institutional trading on Yankee bond yield spreads diminishes over a longer period, particularly beyond a one-year window. This finding suggests that the effects of institutional demand are more immediate and may wane as bonds mature. Using trading frequency as an alternative measure, we find consistent results that a high trading frequency is associated with lower bond yield spreads in the robustness test.

We conjecture that the channels through which institutional trading exerts a pronounced influence on Yankee bond offering spreads include credit risk mitigation and liquidity improvement. Particularly, the effects of institutional trading are significantly more pronounced for Yankee bonds issued by firms from countries with weaker creditor protection, lower sovereign ratings, or poorer sovereign liquidity. Issuers from such environments may exhibit greater credit and liquidity risks, resulting in a higher yield premium required by the market participants. Institutional demand helps mitigate these risks by improving price discovery, enhancing liquidity, and signaling confidence in foreign issuers. The effect of risk alleviation should be most pronounced for issuers from countries with the highest sovereign credit and liquidity risks and minimal for those from sovereign entities with the lowest risks. Our findings provide evidence supporting these two channels: The yield-reducing effect of institutional demand is stronger for Yankee bonds of issuers from countries with weak creditor protection or low sovereign liquidity than those of issuers from countries with strong creditor protection or high sovereign liquidity. Lastly, we explore potential reasons for a change in institutional demand and find support for these drivers. In particular, institutional demand may be driven by a “reach for yield” phenomenon when investors are attracted to high yields offered by Yankee bonds when U.S. corporate bond yields are low. We observe a jump in Yankee bond issuance, in both number and volume of issues, when corporate bond yields drop. Market participants also tend to show more interest in issuers with

fewer bond issues compared to those who are frequent issuers. Dividing the sample by the frequency of issues, we find that the bottom 10% group (least frequent issuers) has the highest number and volume of institutional trading of their bonds than the top 10% (most frequent issuers).

Our study makes the following contributions to the literature. First, much of the existing work on the impacts of institutional investor trading behavior on security pricing focuses on the equity markets; our findings add to the strand of studies on the corporate debt market. To the best of our knowledge, this research is the first study that investigates a comprehensive sample of Yankee bonds and provides novel evidence on the important and incremental role of institutional demand in determining foreign bond pricing. Second, our investigation sheds light on the debate regarding the mechanisms through which institutional trading affects market price discovery, which furthers our understanding of the certification role played by institutional investors. Our findings suggest that institutional trading reduces Yankee bond yield spread through the channels of credit risk mitigation and liquidity improvement. As active trading mitigates the perceived credit risk and enhances liquidity, issuing firms from countries with weaker creditor protection or lower sovereign liquidity benefit more from institutional demand in the form of a larger yield-reducing effect. Our results suggest that the impact of investor demand on offering yields can be explained by the mitigation of sovereign credit and liquidity risk, highlighting the heterogeneity in this relation across sovereign entities. Lastly, we present several potential reasons for the change in investor demand, shedding light on the drivers of the institutional trading dynamics in the Yankee bond market.

The rest of the paper is organized as follows. In Section II, we review the relevant literature and propose our hypotheses. The sample and variable construction process is described in Section III. We present the empirical analysis on the determinants of Yankee bonds in Section IV and the impact channels of institutional trading in Section V. We explore the reasons for a change in institutional demand in Section VI. Section VII concludes the paper.

II. Literature Review and Hypotheses

The depth and liquidity of the U.S. security markets provide a robust platform for foreign firms to secure funding. These markets not only facilitate access to capital but also attract a diverse range of investors. Foreign issuers can choose to issue equity in an IPO, a cross-listing offering, or a debt issue in the Yankee bond market. A recent study by Ball et al. (2018) indicates a trend in

foreign firms' cross-border financing decisions. Based on a sample of 3,633 publicly issued bonds from 31 countries from 1992 to 2005, they find that foreign firms issue corporate bonds more frequently at lower offering yields following an equity cross-listing on a U.S. exchange. Firms issue more bonds through public offerings instead of private placements and in foreign markets rather than at home, in both cases at significantly lower yields.[2] This supports the growing importance of foreign debt issues for issuers, suggesting the focus of this study on one of the major foreign bonds, Yankee bonds.

Literature has shown that institutional investors play a significant role in the U.S. financial markets and around the globe. In a robust and resilient financial system, institutional investors, such as mutual funds, pension funds, and insurance companies, actively trade in large volumes. Their trading activity enhances market liquidity and price discovery. For example, Chan and Lakonishok (1995) examine the price impact of institutional trades and find that large trades can cause temporary price pressure, followed by a reversal, but informed trades result in lasting price adjustments. Chemmanur et al. (2010) and Chemmanur et al. (2009) examine the behavior of institutional investors around equity offerings. Their results indicate that institutional investors have significant impacts on both initial public offerings and seasoned equity offerings.

On the bond side, Acharya et al. (2011) suggest that institutional buying reduces credit risk in bond markets by stabilizing prices and reinforcing investor confidence in distressed markets. Ellul et al. (2011) show that institutional trading mitigates price declines and reduces yield spreads, particularly for bonds exposed to systemic risk or those issued in illiquid markets. Brennan and Cao (1997) point out that institutional investors' diversification reduces the yield spread for foreign issuers by broadening the investor base and enhancing demand. Krebbers et al. (2023) find that the levels of investor demand have important economic impacts for bond issuers because high investor demand shortens the time to subsequent bond issues and hence reduces the cost of financing. Theoretically, the purchasing behavior of institutional investors, such as pension funds and mutual funds, can create upward pressure on bond prices, which in turn affects the yields offered on new issues. When institutional demand is strong, it can lead to a more favorable pricing environment for issuers, allowing them to raise capital more efficiently. To summarize, investor demand is expected to play a crucial role in shaping the Yankee bond market. When demand is

[2] About 4% of the sample in Ball et al. (2018) are Yankee bonds. The remainder are foreign bonds issued in various countries outside of the issuers' home countries.

high, it can lead to lower yields for issuers, as investors are willing to accept lower returns in exchange for the perceived bonds. Therefore, we propose the first hypothesis as follows:

H1 (Investor Demand Effect):

Yankee bond yield spread is lower when the trading volume of U.S. institutional investors is greater.

Active trading indicates a higher demand from institutional investors for Yankee bonds, resulting in a lower financing cost. We explore the underlying mechanisms through which institutional trading affects Yankee bond yield spread by proposing two potential channels. The first channel is credit risk mitigation. Institutional investors' activity, especially their informed trading, helps the market better assess the credit risk associated with foreign issuers. Merton (1987) provides a foundational discussion regarding the impact of institutional involvement on price discovery. He proposes a certification effect of institutional investors' trading in the market with incomplete information. The certification effect of institutional trading can reassure other investors about the issuer's creditworthiness and hence influences asset pricing. Cohen et al. (2002) discuss how institutional trading facilitates the incorporation of information into market prices, improving price discovery and reducing uncertainty about issuer creditworthiness. Bushee and Goodman (2007) find that the presence of institutional investors improves governance and disclosure practices, which can signal quality of foreign issuers to gain credibility in the U.S. market. As institutional trading can alleviate sovereign credit risks (creditor protection and/or default risk) and lower risks should be associated with a reduction in yield spreads, we propose that credit risk mitigation is a channel through which institutional trading affects the Yankee bond pricing.

Taking the argument further, issuers from countries with weaker creditor protection or higher credit risk are likely to benefit more from the certification effect, given their higher sovereign-level credit risks. On the other hand, firms from countries with stronger creditor protection or lower credit risk (or the level of sovereign credit risk is close to that of the United States) are less likely to benefit from such certification. More specifically, we expect bonds issued by firms from countries with weaker creditor protections or lower sovereign ratings to benefit more from institutional trading by having a larger reduction in yield spreads. As a result, our second hypothesis is rationalized as:

H2 (Credit Risk Mitigation Channel):

The reduction impact of institutional trading on Yankee bond yield spreads is more significant for issuers that are domiciled in countries with weaker creditor protection or lower sovereign ratings.

The second channel is liquidity improvement. Literature suggests that there is a link between market liquidity and corporate valuation. In extreme cases, crises in the financial markets can be caused by a severe shortage of liquidity (Diamond and Rajan, 2005; Schnabl, 2012). Chava and Purnanandam (2011) provide empirical evidence of this relationship. They show that firms that depend on debt capital suffer more in a financial crisis triggered by illiquidity. During non-crisis periods, market liquidity remains a major pricing factor for firm value and their securities, such as stocks and bonds. In a highly liquid market, the premium demanded by investors for liquidity is relatively low, and issuing firms can time their capital-raising activities during favorable conditions. In addition, liquid markets can allow large transactions to be executed quickly without significantly affecting market prices. This directly reduces the cost of trading for investors, enabling them to accept lower returns on their investments.

Duffie (2010) highlights the role of institutional investors in addressing liquidity constraints, noting that their buying pressure can stabilize markets by absorbing excess supply when other investors retreat.[3] Trading by institutional investors, who are the major investors in the bond markets, contributes significantly to the liquidity of the debt issues. For foreign firms issuing debt in the U.S. market, institutional investment in their debt signals the certification effect as discussed above, while the volume and frequency of trades lead to liquidity improvement. For example, Chaplinsky and Ramchand (2004) find that yield spreads for registered Yankee bonds are generally lower than those for comparable Rule 144A private placements. The difference in yield spreads should reflect, among other factors, the greater liquidity associated with the ample trading opportunities for Yankee bonds compared to the limited trading associated with private placements. Since institutional trading can improve liquidity, and better liquidity should lead to a reduction in yield spreads, we propose that liquidity improvement is a channel through which institutional trading affects the Yankee bond pricing.

Extending the above discussion, issuers from countries with less market liquidity are likely to benefit more from the liquidity improvement effect, given their higher market liquidity risk. On

[3] American Finance Association (AFA) Presidential Address on "Asset Price Dynamics with Slow-Moving Capital" by Darrell Duffie in 2010.

the other hand, firms from countries with higher market liquidity are less likely to benefit from liquidity improvement. Specifically, we expect bonds issued by firms from countries with less market liquidity to benefit more from institutional trading by having a larger reduction in yield spreads. Thus, our third hypothesis is specified as:

H3 (Liquidity Improvement Channel):

The reduction impact of institutional trading on Yankee bond yield spreads is more significant for those issuers that are domiciled in countries with poor market liquidity.

III. Bond Sample and Variable Construction

A. Yankee Bond Sample

We collect a sample of Yankee bond issues from the Mergent's Fixed Income Securities Database (FISD), which provides a high level of detail on individual bond issues and has been commonly used in previous studies on Yankee debt (Miller and Reisel, 2012; Huang et al., 2021). We use the SDC Platinum Global issues database to supplement the bond data to ensure that we have a comprehensive sample of Yankee bonds. To focus on the financing behavior of foreign firms, we require bonds to be issued by the firms that are domiciled outside of the U.S. We exclude bonds issued by governments, foreign agencies, and supranational entities. Bonds embedded with special features, including payment-in-kind (PIK), conversion or exchange options, and a dual currency feature, are also excluded due to the unique characteristics that differentiate them from traditional bonds. For example, PIK bonds allow the issuer to pay interest in the form of additional bonds rather than in cash. Since the interest payments are made in the form of additional bonds, the principal amount of the bond increases over time, which makes it difficult to compare the pricing of a PIK bond to that of a traditional bond. These selection criteria generate an initial sample consisting of 94,031 Yankee bonds issued between 1994 and 2022. In Figure 1, we present the distribution of the Yankee bond sample over time.

[Insert Figure 1 Here]

We observe a significant growth trend in Yankee bond issuance over the sample period, with notable variations. The number and dollar amount of Yankee bond issuances remained relatively low in the mid-1990s and started to gradually pick up toward the end of this decade. This was consistent with the fact that Yankee bonds became a popular financing avenue for issuers

as globalization and integration of financial markets created opportunities for foreign governments and entities to access the US capital markets. In 2000, Yankee bond issuance reached a peak at a total issuance amount of $135 billion associated with 400 issues. Issuing activity slowed down during the dot-com bubble period in the early 2000s. The fluctuation in issuance behavior in the second half of the 2000s was evident: issue amount experienced a jump in 2006 and 2007 and quickly took a sharp dive in 2008 due to the financial crisis, as the credit market froze and investors became more risk-averse. Many issuers struggled to raise capital during this period, and those that did often had to pay much higher coupon rates. Interestingly, compared to the previous year, the issue amount went up significantly while the number of issues decreased in 2009. The period from 2010 to 2019 saw an active and robust issuance of Yankee bonds, corresponding to a period of economic growth and a strong demand for capital. In the most recent period from 2020 to 2022, the issuance of Yankee bonds remained active except for a drop in issue amount in 2022. Note that from 2017 to 2022, the total issue amount in dollars stayed relatively flat while the number of issues surged. This implies a market trend of a decrease in issue size per bond in recent years.

Overall, Figure 1 suggests that Yankee bonds serve as an important source of financing for foreign entities wishing to access the U.S. fixed income market. Yankee bond issuance behavior continues to evolve and has been significantly influenced by economic and market factors, with issuers and investors responding to changing conditions and opportunities in the market.

[Insert Table 1 Here]

We recognize that the distribution of Yankee bond issuance across countries is influenced by a range of factors, including economic conditions, financing needs, and investor demands. Table 1 presents the country-level distribution of the Yankee bond sample. We find that firms from European countries, particularly the British Commonwealth countries, are among the largest issuers of Yankee bonds. The entities from these countries, such as the United Kingdom, Switzerland, the Netherlands, France, Australia, and the Cayman Islands, account for a significant share (more than 93%) of the number of issues. In addition, firms from countries in Latin America, particularly Mexico, Brazil, and Argentina, are prominent players in the market. Moreover, Asian firms, particularly those from Japan, South Korea, and China, are active issuers as well. The Yankee bond market is attractive to these foreign issuers as a way of accessing capital at lower

interest rates than their domestic markets. Foreign issuers can diversify their sources of funding across borders and tap into a different investor base.

Finally, to quantitatively analyze the pricing of Yankee bonds, we require valid information on offering price and other bond characteristics for our empirical analysis below. Based on an initial sample of 94,031 bonds from 1994 to 2022, we require valid information on the offering price, maturity, coupon, and rating from FISD and SDC. The above steps result in a final sample of 26,818 Yankee bond issues.

B. Variable Construction

Pricing of Yankee Bonds

The primary variable of interest, a proxy for Yankee bond pricing, is the spread between the offering yield and the yield on a modified-duration matched United States Treasury bond (*YLDSPD*). In Panel A of Table 2, we report the mean and median of offering yield spreads in percent for 26,818 Yankee bonds in our final example. The yield spread has an average of 7.022% and a median value of 6.917%. The variation in yield spreads over time is relatively large, with the average ranging from 2.278% in 1994 to 11.092% in 2008. The remarkably volatile yield spreads occurred around the financial crisis: a jump in the average yield spread from 5.790% in 2006 to 8.433% in 2007, a peak around 11% during the 2008-09 crisis period, and a drop to 7% to 8% in the immediate years post-crisis. Finally, we observe an upward trend in yield spread during the COVID-19 pandemic.

[Insert Table 2 Here]

Panel B of Table 2 reports the distribution of bonds by industry. Not surprisingly, we find that banks and financial institutions lead in Yankee bond issuance. These issuers include banks and other financial service providers. The popularity of Yankee bonds with banks and financial firms can be attributed to the high liquidity and marketability of debt securities in the US market. Yankee bond issuance allows banks to tap into a highly developed fixed income market to raise funds for various purposes (e.g., capital expansion, regulatory compliance, and refinancing). Financial firms also benefit from the diversification of funding sources by accessing the market with a diverse investor base. Moreover, with the nature of their global reach and capital intensity, firms in the manufacturing and telecommunications sectors, especially from emerging markets,

use Yankee bonds to raise funds for expansion or refinancing. Companies in the energy sector, including oil and gas companies and utility providers, account for about 5% of our sample, indicating that they are also one of the main issuers of Yankee bonds.

Institutional Investor Trading Measures

To measure the impact of institutional investor trading on the prices of Yankee bonds, an appropriate proxy for the institutional trading activity in the Yankee bond market is constructed. We utilize the bond transaction data in the National Association of Insurance Commissioners (NAIC) and Trade Reporting and Compliance Engine (TRACE). TRACE provides comprehensive coverage of transactions of all corporate bonds (Edwards et al., 2007), and data is available from July 2002. NAIC reports insurance companies' bond transactions, and their data starts from 1994. The literature suggests that insurance companies are the largest investors in the U.S. bond market. Schultz (2001) and Campbell and Taksler (2003) estimate that insurance companies hold approximately one-third of corporate bonds outstanding. Further, Edwards et al. (2007) note that insurance companies are sophisticated investors in the fixed income market. We use bond transactions from NAIC from 1994 to June 2002 and both TRACE and NAIC afterwards. The use of NAIC data represents the demand from insurance companies, while the use of TRACE data represents the overall demand of institutional investors. We collect transactions from TRACE and NAIC for each of the newly issued Yankee bonds from the issue date onward. For bonds with transactions reported in TRACE and NAIC on a given day, we carefully examine the trade size and price to identify and remove duplicate observations.[4]

Prior literature suggests that the pricing of bonds in the primary market depends on institutional trading of a corporation's other outstanding bonds (Nikolova et al., 2020; Nagler and Ottonello, 2022). In line with these studies, we measure institutional investor demand for a given newly issued Yankee bond using the institutional investor transactions of existing bonds issued by the same firm before the issuance. The total dollar value of all purchases and sales on a given day is calculated as a daily measure of total institutional trading (*TOTVOL*). This daily trading volume

[4] We follow the approaches specified in Bessembinder et al. (2006) and Bessembinder et al. (2009) to clean the TRACE database (see Appendix A). For example, we remove canceled, corrected, and reversed trades, and trades with erroneous price or volume information. Those marked as "odd lot" trades (i.e., a size substantially smaller than the standard trading unit) are also deleted. Both studies applied rigorous screening procedures to the TRACE database to ensure that the data used for analysis is of high quality and free from errors or anomalies.

is aggregated over the time window within the period [-1 day, -90 day] prior to the origination dates of newly issued Yankee bonds. In addition, we examine the various windows to explore the impact of institutional trading over time : [-1 day, -30 days], [-1 day, -60 days], [-1 day, -90 days], [-1 day, -180 days], [-1 day, -1 year], [-1 day, -2 years], and [-1 day, -3 years].

In addition to total trading volume, net purchasing activity on existing bonds is constructed to reflect the net demand of institutional investors. The net institutional trading volume is calculated as the difference in dollar value between the buying and selling transactions on a given day (*NETVOL*) and is aggregated over different windows before the issue dates. Similarly, we calculate the buy institutional trading volume as the total dollar value of the purchase transactions on a given day (*BUYVOL*), which is aggregated over various windows. In addition to the dollar value of purchase transactions and net purchase transactions, we construct two variables, *BUYRATE* and *NETRATE*, which measure for a given window the ratio of the dollar amount of purchase transactions to the dollar amount of total transactions and the ratio of the dollar amount of net trades to the dollar amount of total transactions, respectively.[5] We regard the total trading volume as the measure of overall investor interest/price pressure from the market. Buy volume and net trading volume show the investor interest in taking a long position in a bond, serving as additional measures of investor demand.

There is a correlation between the frequency with which bonds are traded and their yields. Specifically, bonds that are traded infrequently tend to have higher yields. To account for this, we measure trading frequency using the number of transactions made by institutional investors on the existing Yankee bonds that are issued by the same firm. Following the same procedure in calculating the dollar value of institutional trading volume, the daily measure of total/net/buy institutional trading frequency is first calculated on a given day and aggregated over various time windows prior to each of the new Yankee bond issuances. In the empirical analysis throughout the study, we present results based on the 90-day window. The results using the other windows are similar to those of the 90-day window and are available upon request.

Bond Characteristics and Macroeconomic Variables

[5] We acknowledge that there are alternative measures of investor demand, such as partial adjustments (Wang, 2021) and "upsizing" (Hotchkiss, et al., 2024) in the offering process, or stock purchases by all 13-F filers.

We collect Yankee bond characteristics from FISD and SDC, including offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), medium-term note flag (*MTN*), non-fixed coupon rate flag (*NONFIX*), and bond rating. *CALL*, *SENIOR*, *MTN*, and *NONFIX* are dummy variables indicating if the bond is callable, senior, a midterm-term note, or has a non-fixed coupon rate. Moody's ratings at bond issuance are used and supplemented with Standard & Poor's and Fitch's ratings if ratings are missing from Moody's. We define a dummy variable *INVESTMENT* to equal 1 if the bond has an investment grade rating and 0 otherwise.

To consider the risk preference in the credit markets, we calculate credit spread as the difference in yield between Moody's Baa-rated and Aaa-rated corporate bonds (*CRED*). The difference between the ten- and two-year Treasury rates is defined as the term spread to reflect the dynamics of interest rates (*TERM*). Data on corporate and Treasury rates are obtained from the Federal Reserve Economic Data (FRED) from the Federal Reserve Bank of St. Louis. Definitions of all variables can be found in Appendix B.

C. Descriptive Statistics

Descriptive statistics of the main variables for the final sample of 26,818 Yankee Bonds are reported in Table 3. We find that the offering yield spread (*YLDSPD*) has an average of 7.022% and a median value of 6.917%. These bonds have an average issue size (*AMT*) of $217.6 million and an average maturity (*MAT*) of almost 4 years. About 22.3% of the bonds are callable (*CALL*), whereas 98.6% of the bonds are senior (*SENIOR*). 76.2% of the Yankee bonds in our sample are medium-term notes (*MTN*), and only 6.3% of the bonds have a non-fixed coupon rate (*NONFIX*). The popularity of Medium-term notes is mainly due to the benefit of flexibility and cost-effectiveness. Medium-term notes are registered with the SEC under Rule 415 (the Shelf-Registration Rule), giving issuers the maximum flexibility for issuing securities on a continuous basis. Unlike a regular bond, a medium-term note can be issued in installments during the pre-determined period specified in the shelf-registration filing. This flexibility allows issuers to tailor their financing needs to match their business requirements and take advantage of interest rate movements. Medium-term notes are typically issued through a best-efforts contract, while regular bonds are generally issued through an underwritten contract. As a result, Medium-term notes typically carry a lower yield than regular bonds because of lower underwriting and administrative costs. This makes medium-term notes an attractive option for issuers who want to raise capital

without incurring significant expenses and going through a lengthy underwriting process. Note that the maturities of Medium-term notes range from 9 months to 30 years. Additionally, some Yankee bonds in our sample use non-fixed coupon rates, though they account for a small proportion. Coupon rates on floating rate bonds are periodically adjusted to reflect outstanding market rates. Issuers benefit from issuing floating-rate bonds when interest rates are on a downward trend, preventing them from locking into long-term and high-interest obligations. The literature suggests that bonds with non-fixed (floating) rates typically have lower initial coupon rates compared to fixed-rate bonds, especially when market interest rates are expected to rise. About one in four Yankee bonds in our sample have an investment-grade rating (*INVESTMENT*). Boubakri and Ghouma (2010) suggest that the credit ratings of Yankee bonds depend on the financial health of the issuers and the economic conditions of their home countries. We observe that those Yankee bonds that are rated investment-grade are mainly from countries with a strong economic outlook and legal protection.

[Insert Table 3 Here]

As to the institutional trading activity during a 90-day period before the Yankee bond issuance, we find that an average of $83.6 billion in total trading volume, $29.62 billion in buy trades, and -$24.35 billion in net trades. We find the net volume (*NETVOL*) is negative on average, which is somewhat surprising given how infrequently certain institutions, such as insurance companies, sell bonds (Ambrose et al., 2008). A possible explanation is that investors sell old bonds of the issuer in anticipation of the new offering (Helwege and Wang, 2021). Correspondingly, the ratio of purchase transactions (*BUYRATE*) and the ratio of net purchase transactions (*NETRATE*) are 43% and -15.8%, respectively. Finally, the market credit spread is 1.055% and the term spread is 1.383% on average during the sample period of this study.

IV. Empirical Analysis

A. Baseline Model

In a multivariate framework, we form a model where the at-issuance yield spread is the dependent variable, and the main variables of interest are proxies for institutional demand. We control for the various bond characteristics, including issue size, maturity, callability, seniority, medium-term notes, non-fixed coupon rate, and investment grade rating. We also include the

industry, time, and country fixed effects in the model. The baseline model is specified in Equation (1) below. Variables are defined in Part A of Section IV and Appendix B.

$$\begin{aligned} YLDSPD_{it} = {} & \beta \times Variables\ of\ Interest_{it} + \gamma_1 \times LN(AMT_{it}) + \gamma_2 \times LN(MAT_{it}) + \gamma_3 \times CALL_{it} \\ & + \gamma_4 \times SENIOR_{it} + \gamma_5 \times MTN_{it} + \gamma_6 \times NONFIX_{it} + \gamma_7 \times INVESTMENT_{it} + \gamma_8 \times CRED_{it} \\ & + \gamma_9 \times TERM_{it} + INDUSTRY_{it} + TIME_{it} + COUNTRY_{it} + \mathcal{E}_{it} \end{aligned} \quad (1)$$

The dependent variable *YLDSPD* is the at-issuance offering yield spread of a Yankee bond. The main variables of interest include several measures of institutional demand: total trading volume (*TOTVOL*), buy trade volume (*BUYVOL*), and net trading volume (*NETVOL*). *TOTVOL* reflects overall institutional interest, whereas *BUYVOL* and *NETVOL* represent the institutional interest in taking a long position. A large total trading volume is expected to lead to higher bond prices and therefore lower yield spreads because strong institutional interest in terms of trading reflects market attention on the issuers. Buy or Net trading volume captures the market's long position interest in the Yankee bonds, resulting in a lower yield as well. To avoid the skewness of trading volume, the natural logarithms are applied to the dollar value measures. We also adopt the buy and net transaction ratios (*BUYRATE* and *NETRATE*) as alternative measures to *BUYVOL* and *NETVOL* to alleviate the potential concern of a high correlation between the dollar value measures of trading volume.

We control for bond-related characteristics that are well established as pricing factors in the literature. Specifically, we include the offering amount (*AMT*), maturity (*MAT*), and callability (*CALL*). Bonds with senior status (*SENIOR*) are expected to command lower yields due to their lower risk. Medium-term notes (*MTN*) serve as a preferred vehicle for issuers over regular bonds due to their flexibility and lower issuance costs. Bonds with floating rates (*NONFIX*) typically have a lower issuing yield than fixed-rate debt. Investment-grade bonds (*INVESTMENT*) are expected to have lower yields than high-yield bonds. In line with the literature, the market credit spread (*CRED*) and term spread (*TERM*) are included to account for the overall macroeconomic conditions at the time of issuance. The term spread proxies for the slope of the term structure, and the credit spread reflects the market required premium for credit risk in the U.S. In addition, industry-fixed, time-fixed, and country-fixed effects are included to control for heterogeneity across industries and country-specific time-invariant factors.

[Insert Table 4 Here]

B. Determinants of Yankee Bond Pricing: The Effect of Institutional Demand

Table 4 presents the multivariate regression results for Yankee bond yield spreads using a 90-day window before the bond origination date. The natural logarithm of total institutional trading volume, *LN(TOTVOL),* is first examined in Panel A. Across all four models with or without controlling for different fixed effects, the coefficient on total institutional trading volume is negative and significant at the 1% level. For instance, the coefficient of -0.022 in Model 1 indicates that a one-percent increase in total trading volume within the 90 days before the origination date is associated with a 2.2% decrease in the offering yield of Yankee bonds, an equivalent of 15.45 basis points (= 2.2% × 7.022% average yield spread) for an average bond. Consistently, the coefficient in Model 4 remains negative and significant at -0.012 after controlling for industry-fixed, time-fixed, and country-fixed effects. This indicates that a one-percent increase in total trading volume is associated with a reduction in the offering yield of 8.43 basis points (= 1.2% × 7.022% average yield spread).

In terms of bond characteristics, we find that a larger offering size, seniority, medium-term note, floating rate, and investment grade are associated with a lower yield spread. Larger issuances are usually associated with well-established issuers with a long financial record, which increases investor confidence and hence lowers the required yield. Seniority provisions in bond contracts offer investors a priority claim on the issuer's assets in case of default. This reduces the credit risk for bondholders compared to subordinated debt, and consequently, investors are willing to accept a lower yield. Medium-term notes offer issuers the flexibility of continuous offerings and lower issuing costs, thus resulting in a lower yield. Similarly, bonds with floating (non-fixed) rates generally carry a lower issuing yield than fixed-rate debt as investors benefit from higher interest payments when market interest rates rise due to economic factors such as growth and inflationary pressure. Bonds with an investment-grade rating are perceived to carry lower default risk. Issuing yield is lower because investors are willing to accept lower returns for safer investments. In addition, we find that callable bonds have higher yield spreads, which is consistent with the bond pricing theory. A call option gives issuers the option to redeem (call) the bond before maturity, typically when interest rates fall. Partial or full redemption allows the issuers to refinance at a lower rate but forces the bondholder to reinvest a large lump sum when market rates are low. As a result, investors demand higher yields to compensate for this reinvestment risk.

We observe that maturity has a negative effect on the offering yield spreads. In theory, long-term bonds are expected to have a higher yield spread than short-term bonds due to maturity risk. The negative correlation in our study between bond maturity and yield spread is mainly caused by the mid-term notes.[6] Although the maturity range of medium-term notes is similar to that of regular bonds, their average maturity is generally shorter at 5-7 years compared to 10-15 years for the regular bonds. Major investors in the bond market, such as insurance companies and pension funds, may prefer long-duration bonds to match their long-term liabilities. This sustained demand for long-term bonds can drive prices higher and yields lower, leading to a negative correlation between maturity and yield spreads.

In Models 3 and 4, we add the market credit and term spread variables to the regressions to control for credit and interest rate dynamics. A larger credit spread suggests that the market requires a larger premium on credit risk, leading to a higher yield on bonds. A widening term spread suggests that investors expect interest rates to rise in the future, which can lead to a larger premium demanded by bond investors. The positive coefficients of both variables are consistent with these theoretical predictions. More importantly, after controlling for these macroeconomic factors, the impact of institutional trading volume remains significant and negative. Our finding suggests that institutional investor trading has a significant and incremental explanatory power on the yield spread of Yankee bonds.

In Panel B of Table 4, we present the regression results using the trading volume from purchase transactions and net trades as the main explanatory variables. Models 1 and 2 report the results for the natural logarithm of buy trading volume and the natural logarithm of net trading volume, respectively. We find that the buy or net trading volume has a significantly negative impact on offering yield spreads, suggesting a lower financing cost on the newly issued Yankee bond when there is greater institutional investor buy or net trading activity of the existing Yankee bonds by the same issuers. The results for the ratios of buy and net buy trading volume are shown in Models 3 and 4, respectively. Consistently, the coefficient on the ratio of buy and net trading volume remains significant and negative after including total trading volume. The reduction impact of institutional trading on yield spreads is found in total, buy, and net trading volume. Use the result in Model 3 as an example: The coefficients of -0.029 on *LN(TOTVOL)* and -0.212 on *BUYRATE* suggest that a one-percent increase in total trading volume will reduce the offering yield

[6] The correlation of bond maturity and yield spread becomes positive if we consider only regular bonds.

spread by 20.36 basis points (= 0.029 × 7.022% average yield spread) and an additional 1.49 bps (= 0.212 × 1% increase in buy trade volume × 7.022% average yield spread) decline in offering yield spread for a one-percent increase in buy trading volume. These findings are consistent with the prediction of our Hypothesis 1. Institutional investor trading decisions could reflect timely assessment of the issuers, credit risk, market conditions, and economic indicators. Their trading activity, which proxies for their demand/interest in the bond issue, leads to price pressure in the market and a direct impact on Yankee bond pricing.

C. Robustness Tests

In this section, we conduct multiple robustness tests. About 68% of issuers of Yankee bonds in our sample are from the U.K. The sizable proportion of Yankee bonds issued by the UK firms is also observed by Ambrocio et al. (2022) and Dell'Anno (1999). By issuing Yankee bonds, U.K. firms can access a diverse group of investors, particularly institutional investors in the U.S., including pension funds, insurance companies, and mutual funds. However, a dominating percentage of the U.K. issuers in our sample may make it harder to generalize the implications of our findings. To address this issue, we exclude the U.K. firms from the sample and re-examine the impact of institutional trading on yield spreads. The result in Model 1 of Table 5 shows that the coefficient on total or net trading volume remains significantly negative. The cost-reduction effect of institutional trading is not driven by the U.K. firms. In addition to unbalanced geographic distribution, heterogeneity across various industries may be another concern since a considerable proportion of issuers in our sample are from the finance industry. As shown in Panel B of Table 2, banks and financial firms are dominant issuers in the Yankee bond market. Since financial institutions are typically well-versed in navigating the bond markets, their unique capacity enables them to structure and time bond issuances strategically to optimize the terms and conditions and tailor to investor demands. Although this argument is reasonable, an unbalanced sample can lead to a question about whether financial firms drive the main finding. To address this concern, we run the regressions for the non-financial firms only. Model 2 of Table 5 shows a significant and negative coefficient of total trading volume, confirming the yield reduction effect of institutional trading in the Yankee bond market. We note that the coefficient on the net trading volume is negative but insignificant.

[Insert Table 5 Here]

Next, we examine whether our main finding remains robust when we exclude certain periods to ensure data consistency or to remove the impacts of shocks. As TRACE data starts in July 2002, we use the bond trading data from NAIC from 1994 up to July 2002. We acknowledge that the NAIC data does not have the same coverage as TRACE. To examine if our findings are mainly driven by the period after 2002, when TRACE data became available, we run the regression using the period before 2002, where only NAIC data is used. The result reported in Model 3 shows that total trading volume continues to have a significant and negative effect on yield spreads, while the net trading volume loses statistical significance. We also consider the potential bias that may be introduced by noisy trading during a time of crisis. To alleviate this bias, we create two subsamples: a subsample by excluding the financial crisis period (December 2007 to July 2009) and the other subsample by excluding the financial crisis period and the COVID-19 pandemic (March 2020 to 2022). Models 4 and 5 report the regressions for these two subsamples, respectively. The results for both subsamples are consistent with the main finding: a significant and negative impact of institutional trading on Yankee bond yield spreads.

D. Does the Timing of Institutional Trading Matter?

In the empirical analysis, we report the results based on a window of 90 days before the origination dates of newly issued Yankee bonds to investigate the impact of institutional trading on Yankee bond yield spread. In this section, we explore whether the impact of institutional trading on bond pricing depends on the timing of institutional trading activity. Regressions based on seven distinct periods are reported in Table 6. As indicated by the sample sizes across Model 1 through Model 7, institutional investors trade more in the near term before the new Yankee bond issuances. For example, 18,429 new bond issuances are found to have institutional trading within 30 days before bond offering, whilst only 8,097 new bond issuances are associated with institutional trading in the period between one and two years before the bond offering. We also find that the coefficient of *LN(TOTVOL*) is the most prominent in Model 3 (-61 days, -90 days), but becomes insignificant in Models 6 and 7 when institutional trading occurs in more than one year before the offering of a new Yankee bond. This suggests that institutional trading immediately before Yankee bond issuance has a significant impact on reducing bond yield spread, but the impact diminishes as trading is measured further back from the issue date. This result is not surprising as investors pay closer attention to the overall market trading activity as time gets closer to the offering date.

In contrast, the coefficient of *NETRATE* remains consistently negative and significant throughout all models. The investor demand information reflected in net trading volume likely conveys a solid and persistent signal to market participants.

[Insert Table 6 Here]

E. Trading Frequency

In the main analysis, we examine the effect of the dollar trading volume on Yankee bond pricing. We recognize that trading frequency plays a significant role in liquidity in the fixed income markets (Bao et al., 2011; Bessembinder et al., 2006). The literature suggests that investors who seek to minimize liquidity risk prefer bonds with higher trading frequency. Given the baseline result of a strong impact of institutional dollar trading volume, we expect investors to regard high trading frequency as an additional avenue to reduce the exposure to liquidity risk. Based on this conjecture, we perform empirical analysis by using trading frequency as an alternative measure of institutional demand. Table 7 reports the results. For each new Yankee bond issue, trading frequency is measured by the number of transactions on the outstanding Yankee bonds issued by the same firm over 90 days before the issue date. We calculate three variables of trading frequency: total trading frequency (*TOTFREQ*), buy trading frequency (*BUYFREQ*), and net trade frequency (*NETFREQ*). We find that the coefficients on total trading frequency and buy frequency are significantly negative. This result is consistent with our hypothesis that higher trading frequency may signal better liquidity and efficient price discovery. On the other hand, we do not find the effect of the net trade frequency to be statistically significant. This can be attributed to the fact that the frequency of buy orders is close to that of sales orders (132 vs. 139 transactions within 90 days before the new bond's origination). This finding suggests that bond investors discern liquidity improvement from how active the transactions are (i.e., the total number of trades) rather than observing more buy trades than sell trades. The coefficient of total trading frequency remains significantly negative in Models 4 and 5 when we include the total dollar trading volume and the ratio of net buying volume in the regressions. More importantly, both the trading volume and net buying ratio have consistent coefficients as shown in the baseline regressions. In sum, we have further confirmation of Hypothesis 1 that higher dollar volume and frequency of institutional trading are associated with a reduction in the financing cost of Yankee bond issuers.

[Insert Table 7 Here]

V. Channels of Institutional Trading on Reducing the Yankee Bond Yield Spreads

The results presented so far indicate a strong yield reduction impact of institutional trading on the Yankee bonds. We next explore the underlying mechanisms through which institutional trading affects bond pricing. As proposed in the hypothesis section, the link between institutional investor transactions and Yankee bond yields may be explained by two channels: credit risk mitigation and liquidity improvement. Below, we examine these two channels.

A. Credit Risk Mitigation Channel

The literature finds that investors need assurance that their investments can be protected by a reliable legal system. Weak legal protections can lead to uncertainties and risks, making investors hesitant to commit their resources. The Legal Rights Index, developed by the World Bank as part of its Doing Business indicators, measures the strength of legal frameworks for creditor rights, including bankruptcy laws and collateral enforcement. For the Yankee bond investors, the Legal Rights Index serves as a benchmark for evaluating the legal environment of foreign issuers. For example, many investors prefer U.S. or European bonds due to their strong legal systems, while emerging markets with weaker creditor protections often require a more detailed due diligence process. As a result, bondholder rights in the issuing firm's home domicile may affect the influence of institutional trading on bond yields. Previous studies (Miller and Reisel, 2012; Qi et al., 2011) show there is a trade-off between investor protection within the country of the bond issuer and the number of protective covenants attached to an individual bond. Issuers from countries with weak creditor protections often face low investor confidence due to uncertainties about enforcing claims in the event of default. Institutions often act as anchor buyers, creating initial demand during issuance. This participation signals confidence to other market participants, helping to sustain secondary market activity. Based on Hypothesis 2, we expect issuers from countries with weaker creditor protection, given their higher risk, to benefit more from the certification effect by having a larger reduction in yield spreads.

We integrate two widely recognized indices into a measure of creditor protection, the Creditor Rights Index (*CRI*). For the period from 1994 to 2003, we use the credit rights index from Djankov et al. (2007), which captures the legal environment for creditor protection using a 4-point

scale. For the period after 2003, we adopt the World Bank's Strength of Legal Rights Index, which provides an extended assessment of creditor rights using a 12-point scale.[7] To ensure comparability and consistency across time, we rescale the World Bank index by a factor of 3. This adjustment aligns with the values based on a 4-point scale in Djankov et al. (2007), allowing us to construct a unified and continuous measure of creditor protection throughout the sample period. We use the median value of CRI to create two subsamples and assess the impact of institutional trading on bond yield spreads by running subsample regressions. Models 1 and 2 of Table 8 show that the coefficient of *LN(TOTVOL)* is significant and negative (-0.018) for the issuers from the low CRI countries, while it is insignificant for those from the high CRI countries. Institutional trading reduces the Yankee bond yield spreads when the issuers come from countries with a low CRI. However, institutional trading does not have a significant impact on those issuers who come from countries with a high CRI. We find consistent results in Models 3 and 4: The coefficients on total institutional trading and net trading ratio are significantly negative only in the low CRI subsample.

[Insert Table 8 Here]

Additionally, the inclusion of sovereign credit risk in institutional investors' decision-making process has been discussed in the literature. Sovereign credit risk impacts financing costs, currency stability, and risk premium. The interconnectedness of sovereign creditworthiness with the broader financial system requires institutional investors to account for sovereign risk as a core factor in their investment decisions. Acharya et al. (2014) show how sovereign distress impacts corporate borrowing through increased yields and tighter financing conditions. Strong institutional investor demand signals the quality of foreign issuers to gain credibility in the U.S. market, alleviating market participants' perception of their sovereign credit risk. This suggests the influence of institutional trading on the Yankee bond prices should be more prominent for issuers from countries with higher sovereign credit risk.

The sovereign credit risk measure is created using the Standard & Poor's Global Ratings, Credit Watch, Credit Outlook, and Bhatia (2002). To create this measure, we follow the Gande and Parsley (2005) and calculate a comprehensive credit rating (*CCR*) using the sovereign credit

[7] Data is collected from the World Bank database (https://databank.worldbank.org/home).

ratings.[8] Ratings from C to AAA are coded from 1 to 21. One is subtracted from the rating if the credit outlook for a country is rated negative, and 0.5 is subtracted if the credit outlook is "credit watch – negative." Similarly, positive adjustments are made for credit outlook rated positive or "credit watch – developing."[9] Sample bonds are categorized into the Low CCR and High CCR subsamples using the median rating. Regression results of Yankee bond yield spreads on institutional trading variables are presented in Table 9. In Models 1 and 2, the coefficient of total institutional trading volume is significant and negative in both subsamples, though the magnitude of the coefficients suggests a more pronounced impact of institutional trading for the low CCR subsample. Models 3 and 4 suggest that total trading volume has a significantly negative effect on Yankee bond pricing for the low CCR subsample but not for the high CCR subsample. The coefficient on net trading ratio is significant in both models, and the Chi-squared test indicates no significant difference between the two coefficients.

Overall, we find support for the conjecture that institutional trading alleviates sovereign credit risks (creditor protection and/or default risk) through the certification effect, resulting in a reduction in yield spreads. As the results have shown, the certification effect matters most for issuers with the most sovereign credit risks. Our findings are consistent with Hypothesis 2 that credit risk mitigation is a channel through which institutional trading activity affects Yankee bond pricing.

[Insert Table 9 Here]

B. Liquidity Improvement Channel

As stated previously, one of the most attractive features to Yankee bond issuers is the high liquidity of the U.S. market. Liquidity is foundational to bond investors as it enables efficient pricing and enhances market stability. Greenwood and Vayanos (2010) highlight the vital role of sovereign liquidity in shaping the benchmark of broader financial market pricing. As discussed above in Hypothesis 3, institutional trades contribute greatly to the liquidity of the bonds. For

[8] Sources include S&P Global Ratings (https://disclosure.spglobal.com/sri/), Credit Watch, Credit Outlook, and the IMF working paper by Bhatia (2002). An alternative proxy for a country's standalone credit risk is the credit default swap rates (e.g., Beber et al., 2009). Due to data limitations on credit default swap rates for a global sample, we developed a comprehensive credit rating to measure the sovereign credit risk.

[9] Almeida et al. (2017) use a numeric index of bond ratings instead of rating fixed effects in their study of sovereign debt ratings.

foreign issuers, trading volume and frequency can lead to liquidity improvement. As institutional trading helps improve liquidity and better liquidity is linked to lower yield spreads, liquidity improvement is a mechanism through which institutional trading affects the prices of Yankee bonds. We expect bonds issued by companies from countries with less market liquidity to benefit more from institutional trading by experiencing a larger drop in yield spreads.

To proxy for sovereign liquidity risk, the bid-ask spread of the sovereign bonds in the home countries is used. Bid-ask spreads are commonly used as a liquidity measure of a financial asset. In this case, we use it to measure the overall market liquidity in a country.[10] We expect the sovereign bid-ask spread to be higher for countries with low liquidity. The daily closing bid and ask prices for sovereign bonds are collected from Bloomberg. We follow the literature and define the adjusted bid-ask spread on a given day as the difference between the closing bid and ask prices divided by the midpoint of these two prices. We then calculate the average of the adjusted bid-ask spreads using the trading days within the month before the issue date of the new Yankee bonds. The sample is divided into two subsamples based on the median of the adjusted sovereign bid-ask spread. The regression results are reported in Table 10. We find that total trading volume leads to a significant reduction in yield spreads for the low sovereign liquidity group, but not for the high liquidity group. The coefficient on net trade volume is negative in Models 3 and 4. The Chi-squared test suggests a significant difference in the coefficients between the two groups: -0.638 for the low sovereign liquidity group and -0.250 for the high sovereign liquidity group. The results support that institutional trading helps alleviate liquidity concerns, and issuers located in countries with severe liquidity risk benefit most from this liquidity improvement effect.

[Insert Table 10 Here]

As an additional test of the liquidity channel, we explore whether the offering method, namely public offering or private placement, plays a role in the link between institutional trading and Yankee bond pricing. Different from a public offering, issuers in a private placement can negotiate directly with institutional investors or work with an investment bank to identify buyers. Private placements under Rule 144A are exempted from registration with the SEC. Issuers are

[10] Another possible option is to use the spread between a government guaranteed agency bond and sovereign debt, e.g., Monfort and Renne (2013), but we do not have a large enough sample of government guaranteed agency bonds for the countries and time period in our sample.

required to provide informational documents to Qualified Institutional Buyers (QIBs). Trading is often restricted to QIBs. As a result, private placement debt is generally less liquid due to a smaller pool of eligible investors and limited secondary market trading. Chaplinsky and Ramchand (2004) look at the borrowing costs of firms in the Rule 144A market. Hotchkiss et al. (2007) find that private placement bonds issued under Rule 144A trade less frequently and at higher yield spreads than their public counterparts. Huang et al. (2021) provide an in-depth discussion of Rule 144A issuers and how they compare to the Yankee bond issuers.

We divide the Yankee bond sample into public and private placement subsamples and perform regressions of yield spreads on institutional trading by subsample. Table 11 presents the results. We first find that total institutional trading volume remains negative and significant at the 1% level for public placement (Model 1) and private placement (Model 2). However, we observe a difference between the two groups in Models 3 and 4 results: Total and net institutional trading have a negative and significant effect on yield spreads for public bonds, but not for private placement bonds. The result suggests that, compared to public bonds, institutional trading exerts less influence on privately placed Yankee bonds, primarily due to a restricted investor base and an inherent limit on trading activity. In this case, institutional demand has a much less impact on liquidity and therefore the pricing dynamics of private placement debt. In sum, our findings support the hypothesis that liquidity improvement is a channel through which institutional demand affects Yankee bond pricing.

[Insert Table 11 Here]

VI. What Drives the Change in Institutional Demand?

In this study, we focus on the price pressure associated with institutional investor demand, and our results support a significant relation between investor demand and Yankee bond pricing. Particularly, our results suggest that, in addition to the previously documented drivers, investor demand/price pressure is an additional and important driver of Yankee bond pricing at issuance. A follow-up and related question is: What causes a change in investor demand? In this section, we explore possible reasons for the institutional demand to change.

We conjecture that Yankee bonds may provide a higher yield than U.S. domestic bonds, resulting in a "reach for yield" phenomenon by institutional investors. To see if there is support

for a "reach for yield" effect on the institutional demand of Yankee bonds, we examine the relation between Yankee bond issuance behavior and U.S. corporate bond yields over the sample period. Figure 2 presents the average BBB-rated bond yields, the number and dollar amount of Yankee bond issues on an annual basis from 1994 to 2022. We observe that Yankee debt issuances, in both number and dollar amount of issues, are negatively related to the level of the BBB bond yields in general. For example, a downward trend in BBB bond yields from 2012 to 2019 is accompanied by an upward trend in the Yankee bond issuances. A sharp drop followed by a steep climb in BBB yields between 2019 and 2022 corresponds with a spike followed by a large dip in the Yankee issues, especially in the number of issues. Correlation coefficient between BBB bond yields and the number (dollar amount) of Yankee bond issues is -0.891 (-0.863), which is significant at the 1% (1%) level. The result lends support for the "reach for yield" effect to be a potential factor for a change in institutional investor demand.

[Insert Figure 2 Here]

Many countries do not have well-developed bond markets, and instead, most of the funding is through banks. One could expect a higher institutional demand if issuance is rare, which may occur because the firm mainly used its own country's banks for financing previously. To explore the possibility that institutional investor demand is related to issue rarity, in a given year, we rank the issuers by the total number of Yankee Bond issues they have issued from 1994 (the beginning of the sample year) to the year prior. We then examine the investor demand of the top 10% of issuers with the most issues and the bottom 10% of issuers who issued the least number of bonds. We find that the bottom 10% group (infrequent issuers) has a higher dollar trading volume, buy trading volume, and number of trades than the top 10% group (frequent issuers). T-tests indicate that the mean is significantly different between the two groups. The finding indicates that rare issues, in terms of prior issuance behaviors of the issuers, seem to attract great market interest and institutional demand. The evidence suggests that issue rarity may be another reason for institutional demand to change.

In Part B of Section IV, we mention that certain institutions follow a buy-and-hold strategy in general and would not sell bonds unless needed, such as the sales of fallen angels as described in Ambrose et al. (2008). Thus, a possible explanation for investor interest in the new issues of Yankee bonds is that investors are selling old bonds of the issuer in anticipation of the new offering

(Helwege and Wang, 2021). In sum, we believe the above are potential reasons for a change in investor demand, which in turn leads to an impact on Yankee bond yields.

VII. Conclusion

This study examines the impacts of institutional trading activity on security pricing in a context where foreign firms from various sovereign entities issue Yankee bonds in the U.S. market. We find that foreign firms with significantly higher institutional trading volume of prior debt issues are linked to a lower yield spread on the new issue of Yankee debt from the same issuer. The evidence supports that the trading activity of institutional investors serves as a crucial factor driving the prices of Yankee bonds. This effect is particularly critical to the process of foreign bond pricing, where the past trading activity reflects market participants' assessment of the issuers and their debt issues. Our robustness tests confirm that the cost-reduction impact of institutional trading remains significant for non-U.K. issuers and non-financial firms, clearly demonstrating that this benefit is not limited to a particular country of origin or a specific industry sector. In addition, the effect of institutional demand remains robust after we exclude the financial crisis and COVID-19 pandemic periods.

Furthermore, our study provides support for credit risk mitigation and liquidity improvement channels through which institutional investor demand affects Yankee bond pricing. The influence of active trading is more pronounced for issuers from countries with less creditor protection, poor sovereign credit rating, or low sovereign liquidity. These findings have important implications for firms that are considering issuing debt in cross-border markets. Particularly, the impact of institutional investor trading can alleviate the concerns of sovereign credit and liquidity risks, which can lead to a lower financing cost. We also explore possible reasons for the change in investor demand. This study sheds light on the complex dynamics of the Yankee bond market and highlights the importance of understanding the critical and incremental role of institutional investor trading in determining the prices of Yankee bonds.

Appendices

Appendix A: TRACE Database

The TRACE database includes observations that represent trades that did not occur. Trades may be input with errors and need to be corrected, may be cancelled on the trading day or another day in the future, or may have both sides of a trade report the trade. Each observation will have a unique sequence number, coded as MSG_SEQ_NB, for a given CUSIP and date. Original trades are recorded with TRC_ST equal to "T," "G," or "M" depending on the date of the trade. Modifications are recorded with TRC_ST equal to "W," "I," or "O," while cancellations are recorded with TRC_ST equal to "C," "H," or "N." Either a modification or a cancellation will have the same date, recorded as TRD_EXCTN_DT, as the original trade. The modifications and cancellations will also include the original sequence number, coded as ORIG_MSG_SEQ_NB, of the trade they are adjusting. We can match the cancellations and modifications to the original trade using the date, CUSIP of the bond, and the original sequence number. We then eliminate all original observations of trades that are later modified or cancelled. We also eliminate the final observations of trades that are cancelled.

Trades that are cancelled on a future date will be marked as reversals with an ASOF_CD equal to "R." These cannot be matched to the original trade via ORIG_MSG_SEQ_NB the way cancellations and modifications can, as the sequence numbers are unique within days. Thus, reversals must be matched manually using the CUSIP, execution date, execution time, price, volume, reporting party's buy/sell perspective, and the reporting party's type (either dealer or customer). Both observations are eliminated upon a successful match.

We still have remaining reversal observations that are unmatched to our original transaction data. The information for the reversals is manually input into the dataset by traders, so it is possible that they did not report an exact match on the trade execution time. Thus, we match reversals to our original trades database using CUSIP, execution date, price, volume, reporting party's buy/sell perspective, and the reporting party's type. We again eliminate both observations upon a successful match. The remaining reversals that are unmatched are subsequently removed from our database without matching an original trade.

Appendix B: Variable Definition

Variable	Description
YLDSPD	The difference between the offering yield of a Yankee bond and the yield of the US Treasury bonds that are matched by modified duration.
AMT	The dollar amount of Yankee bonds at issuance.
MAT	Yankee bond maturity in years.
CALL	Defined as a dummy variable that takes the value of one if a Yankee bond is callable and zero otherwise.
SENIOR	Defined as a dummy variable that takes the value of one if a Yankee bond has a higher priority in repayments than other bonds in the event of a default, and zero otherwise.
MTN	Defined as a dummy variable that takes the value of one if a Yankee bond is a medium-term note and zero otherwise.
NONFIX	Defined as a dummy variable that takes the value of one if the coupon rate of a Yankee bond is not fixed and zero otherwise.
INVESTMENT	Defined as a dummy variable that takes the value of one if a Yankee bond has an investment-grade rating and zero otherwise.
TOTVOL	The total dollar value of all purchases and sales of all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
BUYVOL	The total dollar value of purchases of all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
NETVOL	Defined as the difference in dollar value between the purchases and sales of all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
BUYRATE	Defined as the ratio of the dollar amount of purchases to the dollar amount of total transactions on all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
NETRATE	Defined as the ratio of the dollar amount of net trades to the dollar amount of total transactions on all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
TOTFREQ	Defined as the total number of all purchases and sales of all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
BUYFREQ	Defined as the number of purchases of all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.
NETFREQ	Defined as the difference in trade count between purchases and sales on all Yankee bonds previously issued by the same issuers during a certain time window before the newly issued Yankee bond.

CRED	Market credit spread is defined as the difference in yield between Moody's Baa-rated and Aaa-rated U.S. corporate bonds.
TERM	Term spread is defined as the difference in yield between the ten- and two-year Treasury securities.
CRI (Creditor Rights Index)	CRI is constructed using the creditor rights index from Djankov et al. (2007) from 1994 to 2003 and the legal rights index developed by the World Bank's Strength of Legal Rights Index from 2003 to 2022. Djankov et al. (2007) data are based on 4-scale values, while the extended World Bank data are based on 12-scale values. The values of the World Bank data are scaled by 3 to be on a comparable basis.
Sovereign CCR (Comprehensive Credit Rating)	Sovereign CCR is constructed using Standard & Poor's long-term sovereign debt ratings, Credit Watch, and Credit Outlook (Gande and Parsley, 2005). Ratings from C to AAA are coded as 1 to 21. One is subtracted from the rating if the credit outlook for a country is rated negative, and 0.5 is subtracted if the credit outlook is "credit watch – negative." Similarly, positive adjustments are made for credit outlook rated positive or "credit watch – developing."
Sovereign Bid-Asked Spread	The daily closing bid and ask prices for sovereign bonds are collected from Bloomberg. We define the adjusted bid-ask spread on a given day as the difference between the closing bid and ask prices divided by the midpoint of these two prices. Sovereign bid-ask spread is defined as the average of the adjusted bid-ask spreads using the trading days within the month before the issue date of the new Yankee bonds.
Public/Private Placement	A given Yankee bond is identified as a private placement if it is issued under Rule 144A and a public offering otherwise.

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Figure 1: Yankee Bond Issuance and Coupon Rates

This figure illustrates the annual distribution of 94,031 Yankee bonds issued between 1994 and 2022. The total number and issue amount (in units of $100M) of bond issues are shown using the left axis. The average coupon rate by year (in percent) is shown using the right axis.

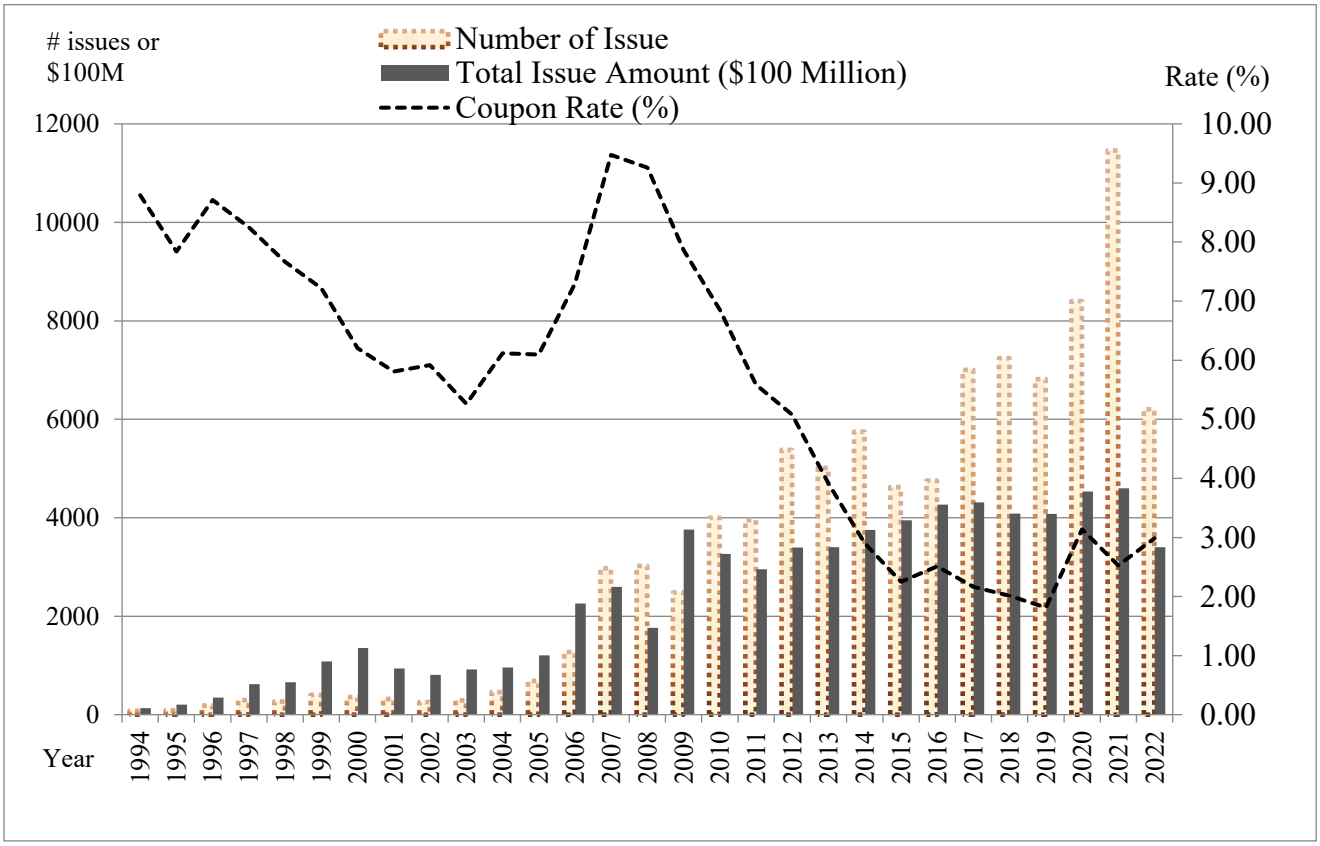

Figure 2: Yankee Bond Issuance and U.S. Corporate Bond Yields

This figure presents the Yankee Bond issuance of 94,031 Yankee bonds and the U.S. average BBB-rated corporate bond yields from 1994 to 2022. The total number and issue amount (in units of $100M) of bond issues by year are shown using the left axis. The average BBB-rated yield by year (in percent) is shown using the right axis.

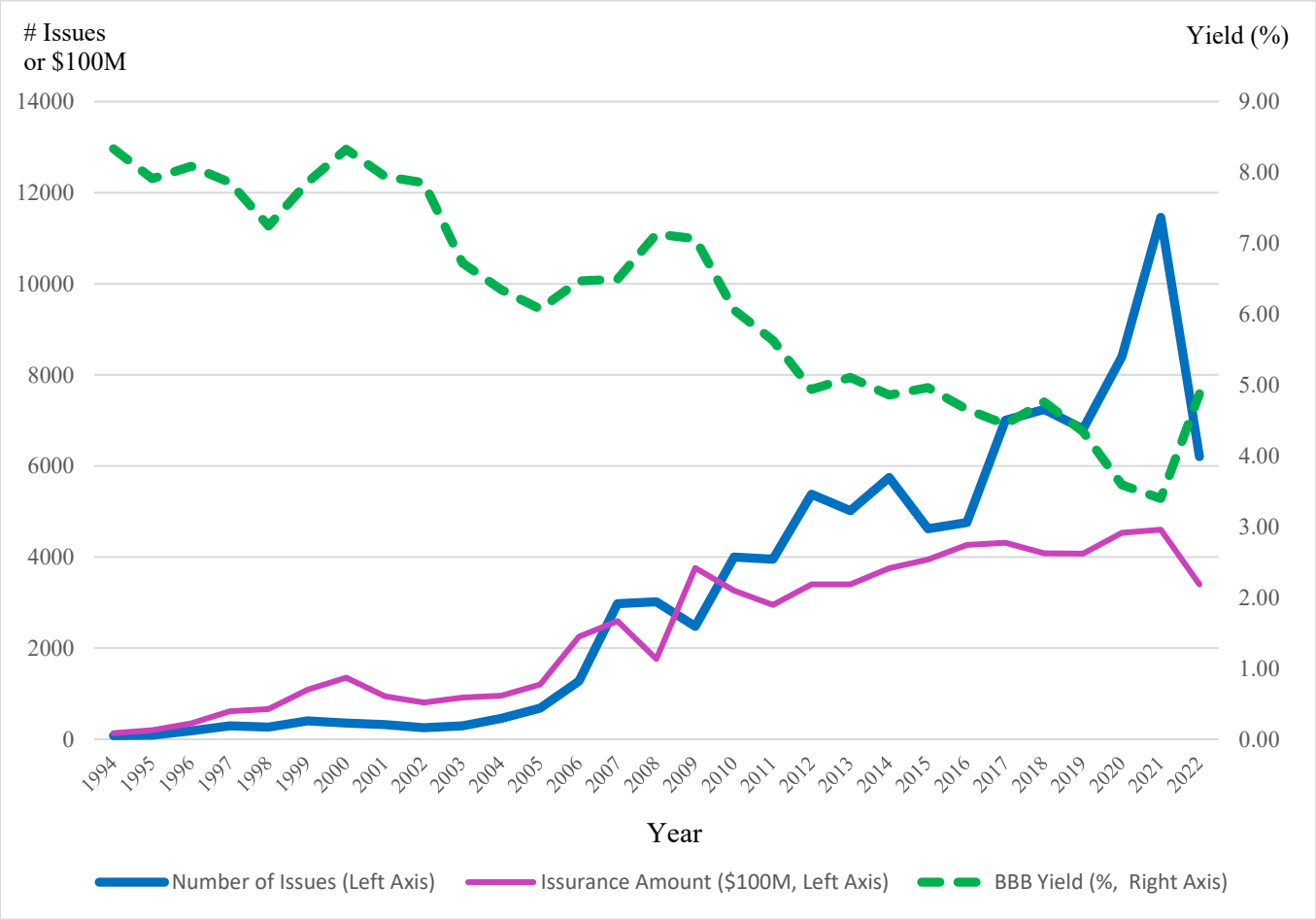

Table 1: Distribution of Yankee Bond Issuance across Countries

This table reports the country-level distribution of 94,031 Yankee bonds issued by foreign firms from 109 countries from 1994 to 2022.

Country	Number of Yankee Bond Issues	Percentage (%)	Country	Number of Yankee Bond Issues	Percentage (%)
United Kingdom	64,051	68.12	Panama	90	0.10
Switzerland	15,916	16.93	Turkey	86	0.09
Netherlands	3,703	3.94	India	82	0.09
France	2,625	2.79	Colombia	75	0.08
Australia	1,026	1.09	Indonesia	75	0.08
Cayman Islands	809	0.86	Peru	75	0.08
Mexico	475	0.51	Russian Federation	70	0.07
Japan	426	0.45	Italy	67	0.07
Brazil	411	0.44	New Zealand	63	0.07
Korea	389	0.41	United Arab Emirates	56	0.06
Ireland	379	0.40	Denmark	54	0.06
Luxembourg	338	0.36	Virgin Islands	54	0.06
China	331	0.35	Finland	46	0.05
Bermuda	238	0.25	Austria	40	0.04
Sweden	225	0.24	Kazakhstan	39	0.04
Argentina	209	0.22	Netherlands Antilles	38	0.04
Chile	179	0.19	Iceland	38	0.04
Germany	162	0.17	Malaysia	36	0.04
Spain	126	0.13	Philippines	35	0.04
Norway	120	0.13	Thailand	29	0.03
Singapore	118	0.13	Israel	25	0.03
Bahamas	107	0.11	Others	389	0.41
Canada	106	0.11	**Total**	**94,031**	**100**

Table 2: Yield Spreads and Industry Distribution of the Yankee Bond Sample

This table provides the mean and median of offering yield spreads (in percent) by year and the number of bonds by industry of the final example of 26,818 Yankee bonds.

Panel A: Mean and Median Offering Yield Spreads (%) by Year

Year	N	Mean	Median	Year	N	Mean	Median
1994	78	2.278	1.540	2009	1,596	10.807	10.850
1995	83	2.376	1.150	2010	2,729	8.587	9.250
1996	166	2.638	2.400	2011	2,176	7.353	8.216
1997	238	2.494	2.195	2012	2,482	7.182	7.592
1998	188	3.144	2.463	2013	1,571	6.758	7.311
1999	270	2.989	2.096	2014	1,258	6.266	6.867
2000	173	2.686	1.959	2015	950	5.390	4.945
2001	176	3.092	2.250	2016	973	5.019	4.690
2002	177	3.504	2.013	2017	963	4.313	3.386
2003	203	3.873	2.370	2018	814	4.291	3.097
2004	303	5.340	5.380	2019	821	3.964	2.820
2005	390	5.232	5.413	2020	1,220	7.524	6.861
2006	697	5.790	5.500	2021	1,100	6.240	5.053
2007	2,027	8.433	7.572	2022	892	5.610	4.134
2008	2,104	11.092	10.500	**Total**	**26,818**	**7.022**	**6.917**

Panel B: Number of Yankee Bonds by Industry

Industry	N	Percentage	Industry	N	Percentage
Manufacturing	1,423	5.31%	Banking	18,862	70.33%
Communications	569	2.12%	Credit/Financing	361	1.35%
Oil & Gas	699	2.61%	Financial Services	3,182	11.87%
Railroad	22	0.08%	Insurance	135	0.50%
Retail	105	0.39%	Real Estate	65	0.24%
Service/Leisure	222	0.83%	Savings & Loan	67	0.25%
Transportation	224	0.84%	Leasing	22	0.08%
Utility	527	1.97%	Unassigned	61	0.23%
Miscellaneous	272	1.01%	**Total**	**26,818**	**100.00%**

Table 3: Descriptive Statistics of Main Variables

This table reports summary statistics on the main variables in our regression analysis. Bond variables include the offering yield spread (*YLDSPD*), offering amount (*AMT*), bond maturity (*MAT*), callable (*CALL*), senior bonds (*SENIOR*), medium-term notes (*MTN*), non-fixed coupon rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Institutional trading variables include total trading volume (*TOTVOL),* buy trading volume (*BUYVOL)*, and net trading volume (*NETVOL*) in dollar amount during the 90-day period prior to Yankee bond issuance. *BUYRATE* is the ratio of buy trading volume to total trading volume, and *NETRATE* is the ratio of net trading volume to total trading volume. We also include macroeconomic factors, including the market credit Spread (*CRED*) and term spread (*TERM*). Continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix B.

	N	Mean	Median	SD	Min	Max
YLDSPD (%)	26,818	7.022	6.917	5.047	0.000	24.500
AMT ($M)	26,818	217.600	2.500	427.900	0.100	2000.000
MAT (Years)	26,818	3.954	1.016	6.013	0.014	100.100
CALL (Dummy)	26,818	0.223	0.000	0.416	0.000	1.000
SENIOR (Dummy)	26,818	0.986	1.000	0.119	0.000	1.000
MTN (Dummy)	26,818	0.762	1.000	0.426	0.000	1.000
NONFIX (Dummy)	26,818	0.063	0.000	0.243	0.000	1.000
INVESTMENT (Dummy)	26,818	0.240	0.000	0.427	0.000	1.000
TOTVOL ($B)	26,818	83.600	1.102	226.000	0.000	1320.000
BUYVOL ($B)	26,818	29.620	0.416	76.560	0.000	421.100
NETVOL ($B)	26,818	-24.350	-0.060	93.320	-888.200	361.700
BUYRATE	21,318	0.430	0.389	0.196	0.000	1.000
NETRATE	21,318	-0.158	-0.199	0.277	-0.998	1.000
CRED (%)	26,818	1.055	0.980	0.372	0.550	3.340
TERM (%)	26,818	1.383	1.460	0.891	-0.670	2.830

Table 4: Determinants of Yankee Bond Yield Spreads: Role of Institutional Trading

This table reports the results of OLS regression of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. Buy trading volume (*BUYVOL*) accounts for all buy trades, while net trading volume (NETVOL) is the difference between purchases and sales. *BUYRATE* and *NETRATE* represent the ratio of buy to total trading volume and the ratio of net to total trading volume, respectively. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

Panel A:					
	Predicated Sign	**[1]**	**[2]**	**[3]**	**[4]**
LN(TOTVOL)	?	-0.022***	-0.028***	-0.029***	-0.012***
		(0.004)	(0.004)	(0.004)	(0.005)
LN(AMT)	-	-0.387***	-0.451***	-0.454***	-0.419***
		(0.011)	(0.011)	(0.011)	(0.012)
LN(MAT)	+	-2.610***	-2.430***	-2.419***	-2.426***
		(0.026)	(0.029)	(0.029)	(0.029)
CALL	+	1.079***	0.449***	0.460***	0.335***
		(0.058)	(0.065)	(0.065)	(0.068)
SENIOR	-	-1.974***	-2.566***	-2.585***	-2.590***
		(0.139)	(0.141)	(0.140)	(0.142)
MTN	-	-1.499***	-1.136***	-1.128***	-1.012***
		(0.073)	(0.073)	(0.073)	(0.078)
NONFIX	-	-1.312***	-0.935***	-0.961***	-0.856***
		(0.091)	(0.096)	(0.096)	(0.097)
INVESTMENT	-	-0.788***	-0.548***	-0.557***	-0.599***
		(0.050)	(0.053)	(0.053)	(0.054)
CRED	+			1.132***	1.161***
				(0.100)	(0.100)
TERM	+			0.524***	0.497***
				(0.081)	(0.080)
INTERCEPT		12.343***	11.677***	10.459***	14.482***
		(0.158)	(0.598)	(0.597)	(0.745)
Industry-fixed Effect		No	Yes	Yes	Yes
Time-fixed Effect		No	Yes	Yes	Yes
Country-fixed Effect		No	No	No	Yes
N		26,818	26,818	26,818	26,818
Adjusted R^2		0.543	0.580	0.583	0.593

Table 4: Determinants of Yankee Bond Yield Spreads: Role of Institutional Trading (Continued)

Panel B:					
	Predicated Sign	**[1]**	**[2]**	**[3]**	**[4]**
LN(BUYVOL)	?	-0.017***			
		(0.005)			
LN(NETVOL)	?		-0.294***		
			(0.073)		
LN(TOTVOL)	?			-0.029***	-0.030***
				(0.008)	(0.008)
BUYRATE	?			-0.212*	
				(0.128)	
NETRATE	?				-0.301***
					(0.092)
LN(AMT)	-	-0.419***	-0.422***	-0.324***	-0.321***
		(0.012)	(0.012)	(0.015)	(0.015)
LN(MAT)	+	-2.424***	-2.424***	-2.570***	-2.563***
		(0.029)	(0.029)	(0.032)	(0.032)
CALL	+	0.337***	0.333***	-0.017	-0.018
		(0.068)	(0.068)	(0.087)	(0.087)
SENIOR	-	-2.585***	-2.599***	-2.468***	-2.459***
		(0.142)	(0.141)	(0.204)	(0.204)
MTN	-	-1.010***	-1.029***	-0.605***	-0.616***
		(0.078)	(0.078)	(0.110)	(0.110)
NONFIX	-	-0.851***	-0.889***	-0.605***	-0.615***
		(0.097)	(0.097)	(0.112)	(0.113)
INVESTMENT	-	-0.598***	-0.600***	-0.525***	-0.520***
		(0.054)	(0.054)	(0.069)	(0.069)
CRED	+	1.165***	1.157***	1.258***	1.263***
		(0.100)	(0.100)	(0.108)	(0.108)
TERM	+	0.500***	0.478***	0.550***	0.548***
		(0.080)	(0.080)	(0.090)	(0.090)
INTERCEPT		14.404***	16.745***	12.323***	12.203***
		(0.746)	(0.891)	(0.880)	(0.861)
Industry-fixed Effect		Yes	Yes	Yes	Yes
Time-fixed Effect		Yes	Yes	Yes	Yes
Country-fixed Effect		Yes	Yes	Yes	Yes
N		26,818	26,818	21,318	21,318
Adjusted R^2		0.593	0.593	0.575	0.575

Table 5: Institutional Trading and Yankee Bond Yield Spreads: Robustness Tests

This table reports the subsample results of OLS regression of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[1]	[2]	[3]	[4]	[5]
	Non-UK Firms	**Non-financial Firms**	**Before 2002 July**	**Excluding Financial Crisis**	**Excluding Financial Crisis & COVID-19**
LN(TOTVOL)	-0.073***	-0.091***	-0.259***	-0.025***	-0.018**
	(0.011)	(0.014)	(0.098)	(0.008)	(0.008)
NETRATE	-0.256**	-0.194	-0.286	-0.253***	-0.297***
	(0.117)	(0.152)	(0.444)	(0.097)	(0.101)
LN(AMT)	-0.526***	-0.026	-0.115	-0.335***	-0.314***
	(0.027)	(0.070)	(0.128)	(0.015)	(0.016)
LN(MAT)	-1.706***	0.063	-0.172	-2.599***	-2.627***
	(0.067)	(0.073)	(0.255)	(0.033)	(0.033)
CALL	-0.430***	0.679***	0.776	-0.157*	0.144
	(0.113)	(0.156)	(0.503)	(0.086)	(0.090)
SENIOR	-2.067***	-1.646*	0.860	-2.464***	-2.438***
	(0.212)	(0.981)	(0.636)	(0.206)	(0.216)
MTN	-0.732***	-0.732***	0.517	-0.631***	-0.434***
	(0.123)	(0.171)	(0.534)	(0.110)	(0.113)
NONFIX	-0.356**	0.288	0.147	-0.281**	-0.445***
	(0.161)	(0.282)	(0.725)	(0.111)	(0.113)
INVESTMENT	-0.457***	-0.803***	-0.550	-0.496***	-0.515***
	(0.096)	(0.110)	(0.361)	(0.070)	(0.072)
CRED	0.920***	0.987***	0.053	1.738***	1.885***
	(0.166)	(0.265)	(1.316)	(0.190)	(0.193)
TERM	0.754***	0.323	1.015	0.461***	0.389***
	(0.161)	(0.205)	(0.669)	(0.098)	(0.100)
Industry-fixed Effect	Yes	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes	Yes
N	7,922	1,854	302	18,965	18,092
Adjusted R^2	0.612	0.343	0.472	0.572	0.578

Table 6: Impacts of Institutional Trading on Yankee Bond Yield Spreads: Does Timing Matter?

This table reports, for distinct nonoverlapping periods, the regressions of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[-1d, -30d]	**[-31d, -60d]**	**[-61d, -90d]**	**[-91d, -180d]**	**[-181d, -1y]**	**[-1y, -2y]**	**[-2y, -3y]**
LN(TOTVOL)	-0.037***	-0.058***	-0.062***	-0.040***	-0.029***	-0.010	-0.009
	(0.012)	(0.010)	(0.010)	(0.009)	(0.010)	(0.011)	(0.012)
NETRATE	-0.078***	-0.078***	-0.087***	-0.058***	-0.091***	-0.385***	-0.264***
	(0.021)	(0.016)	(0.015)	(0.022)	(0.019)	(0.063)	(0.100)
LN(AMT)	-0.272***	-0.291***	-0.316***	-0.350***	-0.395***	-0.461***	-0.474***
	(0.017)	(0.020)	(0.020)	(0.020)	(0.020)	(0.022)	(0.025)
LN(MAT)	-2.652***	-2.539***	-2.519***	-2.500***	-2.366***	-1.912***	-1.681***
	(0.034)	(0.036)	(0.037)	(0.037)	(0.040)	(0.050)	(0.058)
CALL	-0.199**	0.039	0.110	0.265***	0.431***	0.588***	0.542***
	(0.097)	(0.099)	(0.101)	(0.100)	(0.099)	(0.103)	(0.106)
SENIOR	-2.653***	-2.639***	-2.631***	-2.542***	-2.409***	-2.190***	-2.091***
	(0.276)	(0.258)	(0.251)	(0.221)	(0.208)	(0.197)	(0.192)
MTN	-0.324**	-0.235	-0.287**	-0.335***	-0.353***	-0.210*	-0.299**
	(0.143)	(0.144)	(0.140)	(0.126)	(0.121)	(0.119)	(0.122)
NONFIX	-0.409***	-0.484***	-0.573***	-0.586***	-0.868***	-1.054***	-0.626***
	(0.123)	(0.121)	(0.121)	(0.118)	(0.120)	(0.128)	(0.139)
INVESTMENT	-0.493***	-0.637***	-0.551***	-0.599***	-0.607***	-0.363***	-0.349***
	(0.082)	(0.082)	(0.082)	(0.078)	(0.078)	(0.083)	(0.086)
CRED	1.360***	1.184***	1.140***	1.064***	1.194***	1.440***	0.880***
	(0.115)	(0.121)	(0.124)	(0.125)	(0.148)	(0.230)	(0.249)
TERM	0.432***	0.793***	0.660***	0.636***	0.705***	0.496***	0.180
	(0.097)	(0.110)	(0.114)	(0.114)	(0.126)	(0.149)	(0.146)
Industry-fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	18,429	14,034	13,053	13,120	10,739	8,097	6,465
Adjusted R^2	0.562	0.604	0.608	0.611	0.607	0.570	0.563

Table 7: Institutional Trading and Yankee Bond Yield Spreads: Trading Frequency

This table reports the results of OLS regression of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total number of trades (*TOTFREQ*) is the number of purchases and sales of the Yankee bonds issued by the same issuer. The total number of purchases (*BUYFREQ*) accounts for all buy trades, while the net number of trades (*NETFREQ*) is the number of purchases minus the number of sales. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[1]	[2]	[3]	[4]	[5]
LN(TOTFREQ)	-0.015***			-0.025**	-0.268***
	(0.004)			(0.010)	(0.024)
LN(BUYFREQ)		-0.019***			
		(0.004)			
LN(NETFREQ)			0.194		
			(0.124)		
LN(TOTVOL)				-0.010**	-0.146***
				(0.005)	(0.013)
NETRATE					-0.193**
					(0.095)
LN(AMT)	-0.423***	-0.425***	-0.420***	-0.426***	-0.364***
	(0.013)	(0.013)	(0.012)	(0.013)	(0.016)
LN(MAT)	-2.424***	-2.423***	-2.426***	-2.424***	-2.526***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.032)
CALL	0.340***	0.343***	0.334***	0.341***	0.068
	(0.068)	(0.068)	(0.068)	(0.068)	(0.087)
SENIOR	-2.586***	-2.583***	-2.600***	-2.588***	-2.424***
	(0.141)	(0.141)	(0.141)	(0.141)	(0.204)
MTN	-1.014***	-1.016***	-1.018***	-1.019***	-0.759***
	(0.078)	(0.078)	(0.078)	(0.078)	(0.111)
NONFIX	-0.858***	-0.853***	-0.851***	-0.863***	-0.563***
	(0.097)	(0.097)	(0.098)	(0.097)	(0.113)
INVESTMENT	-0.592***	-0.591***	-0.605***	-0.588***	-0.481***
	(0.054)	(0.054)	(0.054)	(0.054)	(0.069)
CRED	1.165***	1.172***	1.163***	1.168***	1.310***
	(0.100)	(0.100)	(0.100)	(0.100)	(0.108)
TERM	0.496***	0.499***	0.498***	0.494***	0.533***
	(0.080)	(0.080)	(0.080)	(0.080)	(0.090)
Industry-fixed Effect	Yes	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes	Yes
N	26,818	26,818	26,818	26,818	21,318
Adjusted R^2	0.593	0.593	0.593	0.593	0.577

Table 8: Impacts of Institutional Trading on Yankee Bond Yield Spreads: Creditor Rights Index

This table reports the Creditor Rights Index (CRI) subsample regressions of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. CRI measures the strength of legal frameworks for creditor rights, including bankruptcy laws and collateral enforcement. CRI is constructed using the creditor rights index from Djankov et al. (2007) from 1994 to 2003 and the legal rights index developed by the World Bank's Strength of Legal Rights Index from 2003 to 2022. Sample bonds are divided into halves using median CRI: low CRI means less creditor protection/rights, and high CRI means more creditor protection/rights. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[1]	[2]	[3]	[4]
	Low CRI	**High CRI**	**Low CRI**	**High CRI**
LN(TOTVOL)	-0.018**	-0.009	-0.069***	0.008
	(0.007)	(0.007)	(0.012)	(0.012)
NETRATE			-0.338***	-0.014
			(0.130)	(0.140)
LN(AMT)	-0.632***	-0.331***	-0.510***	-0.279***
	(0.024)	(0.018)	(0.030)	(0.021)
LN(MAT)	-1.549***	-2.865***	-1.774***	-2.903***
	(0.059)	(0.035)	(0.074)	(0.037)
CALL	-0.081	1.064***	-0.778***	0.882***
	(0.085)	(0.117)	(0.122)	(0.127)
SENIOR	-2.002***	-3.221***	-2.011***	-2.994***
	(0.161)	(0.283)	(0.253)	(0.346)
MTN	-0.701***	-1.182***	-0.351**	-0.960***
	(0.088)	(0.155)	(0.142)	(0.181)
NONFIX	-0.368**	-0.918***	0.095	-0.857***
	(0.143)	(0.137)	(0.178)	(0.143)
INVESTMENT	-0.445***	-0.690***	-0.497***	-0.598***
	(0.074)	(0.090)	(0.111)	(0.100)
CRED	0.876***	1.390***	0.909***	1.521***
	(0.158)	(0.131)	(0.177)	(0.138)
TERM	0.631***	0.412***	0.719***	0.434***
	(0.144)	(0.099)	(0.176)	(0.105)
Industry-fixed Effect	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes
N	10,216	15,303	6,972	13,846
Adjusted R^2	0.615	0.579	0.601	0.572

Table 9: Impacts of Institutional Trading on Yankee Bond Yield Spreads: Sovereign Credit Risk

This table reports the Sovereign Comprehensive Credit Rating (CCR) subsample regressions of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. Sovereign CCR is based on Standard & Poor's long-term sovereign debt ratings, Credit Watch, and Credit Outlook. Sample bonds are divided into halves using median CCR: low CCR means higher sovereign credit risk, and high CCR means lower sovereign credit risk. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[1]	[2]	[3]	[4]
	Low CCR	**High CCR**	**Low CCR**	**High CCR**
N(TOTVOL)	-0.035***	-0.012*	-0.070***	-0.017
	(0.007)	(0.006)	(0.013)	(0.010)
NETRATE			-0.345**	-0.291***
			(0.154)	(0.113)
LN(AMT)	-0.497***	-0.409***	-0.359***	-0.319***
	(0.023)	(0.016)	(0.030)	(0.018)
LN(MAT)	-1.644***	-2.652***	-1.786***	-2.742***
	(0.060)	(0.034)	(0.075)	(0.036)
CALL	-0.246***	0.830***	-1.084***	0.649***
	(0.090)	(0.096)	(0.132)	(0.111)
SENIOR	-1.759***	-3.271***	-1.512***	-3.102***
	(0.172)	(0.216)	(0.240)	(0.321)
MTN	-0.834***	-0.941***	-0.745***	-0.354**
	(0.098)	(0.122)	(0.149)	(0.171)
NONFIX	-0.677***	-0.834***	-0.420***	-0.642***
	(0.130)	(0.128)	(0.148)	(0.145)
INVESTMENT	-0.377***	-0.668***	-0.325***	-0.505***
	(0.080)	(0.076)	(0.113)	(0.091)
CRED	2.045***	1.064***	2.188***	1.180***
	(0.233)	(0.108)	(0.300)	(0.114)
TERM	0.844***	0.395***	0.877***	0.482***
	(0.162)	(0.092)	(0.211)	(0.098)
Industry-fixed Effect	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes
N	7,608	19,152	4,768	16,530
Adjusted R^2	0.555	0.578	0.561	0.552

Table 10: Impacts of Institutional Trading on Yankee Bond Yield Spreads: Sovereign Liquidity Risk

This table reports the Sovereign liquidity risk subsample regressions of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. The adjusted bid-ask spread on a given day is defined as the difference between the closing bid and ask prices divided by the midpoint of these two prices. Sovereign bid-ask spread is defined as the average of the adjusted bid-ask spreads using the trading days within the month before the issue date of the new Yankee bonds. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[1]	[2]	[3]	[4]
	Low Sovereign Liquidity	**High Sovereign Liquidity**	**Low Sovereign Liquidity**	**High Sovereign Liquidity**
LN(TOTVOL)	-0.027***	0.003	-0.025*	-0.004
	(0.009)	(0.007)	(0.015)	(0.011)
NETRATE			-0.638***	-0.250*
			(0.172)	(0.132)
LN(AMT)	-0.231***	-0.486***	-0.171***	-0.412***
	(0.023)	(0.019)	(0.026)	(0.022)
LN(MAT)	-2.879***	-2.340***	-2.878***	-2.450***
	(0.043)	(0.046)	(0.046)	(0.050)
CALL	2.203***	-0.643***	2.125***	-1.099***
	(0.161)	(0.095)	(0.176)	(0.111)
SENIOR	-3.390***	-2.609***	-2.968***	-2.304***
	(0.346)	(0.222)	(0.424)	(0.311)
MTN	-0.246	-1.386***	-0.252	-1.028***
	(0.189)	(0.119)	(0.236)	(0.160)
NONFIX	-1.163***	-0.356***	-1.173***	-0.057
	(0.178)	(0.128)	(0.189)	(0.145)
INVESTMENT	-0.839***	-0.497***	-0.748***	-0.443***
	(0.111)	(0.084)	(0.125)	(0.104)
CRED	1.282***	1.165***	1.420***	1.129***
	(0.164)	(0.139)	(0.171)	(0.150)
TERM	0.284**	0.478***	0.376***	0.508***
	(0.119)	(0.135)	(0.125)	(0.148)
INTERCEPT	14.148	7.629***	7.019	10.642***
	(10,540.881)	(1.136)		(1.049)
Industry-fixed Effect	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes
N	11,379	11,380	10,245	9,477
Adjusted R^2	0.546	0.603	0.528	0.589

Table 11: Institutional Trading and Yankee Bond Yield Spreads: Public Office versus Private Placement

This table reports the public offering and private placement (Rule 144A) subsample regressions of Yankee bond yield spreads on the measures of institutional trading volume, bond characteristics, macroeconomic factors, and three fixed effects. The dependent variable is Yankee bond yield spread (*YLDSPD*), which is defined as the difference between the Yankee bond offering yield and a modified duration-matched US treasury bond yield. Institutional trading is measured over the 90 days before the bond origination date. Total trading volume (*TOTVOL*) is the sum of the dollar value of all purchases and sales of the Yankee bonds issued by the same issuer. *NETRATE* represents the ratio of net to total trading volume. Bond characteristics include the offering amount (*AMT*), maturity (*MAT*), callability (*CALL*), seniority (*SENIOR*), mid-term notes (*MTN*), non-fixed rate (*NONFIX*), and investment grade rating (*INVESTMENT*). Macroeconomic factors include credit spread (*CRED*) and term spread (*TERM*). Robust standard errors are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively. Variable definitions can be found in Appendix B.

	[1]	[2]	[3]	[4]
	Public Offering	**Private Placement**	**Public Offering**	**Private Placement**
LN(TOTVOL)	-0.023***	-0.033***	-0.058***	0.007
	(0.006)	(0.008)	(0.011)	(0.015)
NETRATE			-0.387***	-0.126
			(0.123)	(0.078)
LN(AMT)	-0.312***	-0.548***	-0.244***	-0.104**
	(0.016)	(0.048)	(0.019)	(0.045)
LN(MAT)	-2.647***	-0.285***	-2.680***	0.142**
	(0.032)	(0.062)	(0.034)	(0.064)
CALL	-0.138	0.835***	-0.316***	0.453***
	(0.093)	(0.071)	(0.101)	(0.105)
SENIOR	-2.896***	-0.768***	-2.440***	-0.712***
	(0.249)	(0.129)	(0.319)	(0.142)
MTN	-0.654***	-0.615***	-0.526***	-0.373***
	(0.134)	(0.073)	(0.174)	(0.101)
NONFIX	-0.311**	-0.547***	-0.215	-0.034
	(0.124)	(0.117)	(0.132)	(0.130)
INVESTMENT	-0.549***	-0.376***	-0.455***	-0.481***
	(0.076)	(0.062)	(0.085)	(0.081)
CRED	1.293***	0.827***	1.317***	1.124***
	(0.111)	(0.139)	(0.114)	(0.205)
TERM	0.493***	0.187	0.523***	0.457***
	(0.090)	(0.129)	(0.095)	(0.157)
Industry-fixed Effect	Yes	Yes	Yes	Yes
Time-fixed Effect	Yes	Yes	Yes	Yes
Country-fixed Effect	Yes	Yes	Yes	Yes
N	21,443	5,375	19,162	2,156
Adjusted R^2	0.561	0.373	0.543	0.432