Underwriter competition and institutional loan pricing*

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Abstract

The institutional-loan market is segmented and has specialized underwriters. We document that more intense underwriter competition in a given segment is associated with lower initial loan spreads and more upward rate adjustments. We provide evidence that competition affects underwriters' trade-off between bidding low initial rates to win underwriting mandates and incurring reputational costs when adjusting rates upward in the book-building process. Moreover, stronger underwriter competition lowers final loan spreads without resulting in more defaults or hurting borrowers' access to investors. The impact of underwriter competition is moderated by the uncertainty about investor demand and the existence of prior borrower-underwriter relationships.

JEL Classification: G21, G23, G24, G10

Keywords: Institutional Loans, Underwriter Competition, Relationship Lending, Loan Markets

*We thank participants at the ACFOW and Nanyang Technological University for their comments. We thank S&P Global for providing access to the LCD leveraged loan data. The data access was funded by the Start-up grant provided to Will Shuo Liu by City University of Hong Kong (Project No. 7200643). The work described in this paper was partially supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project No. CityU 21508721).

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I. Introduction

Institutional loans have risen dramatically over the past couple of decades and have become one of the most important venues for firms to obtain credit. As Figure 1 shows, new issuance of institutional loans increased from below $100 billion in the early 2000s to over $600 billion in recent years.[1] Underwriters (i.e., lead banks) play an instrumental role in this market: They intermediate loans and locate institutional investors who are willing to provide capital; They set initial interest rates, and later adjust rates after communicating with loan investors. This rate-setting process is consequential, as the total interest expense of US institutional loans we estimated tops $44 billion each year between 2015 and 2019.

How are interest rates of institutional loans initially set, and why are they later adjusted before launch? In financial markets that depend on underwriting services (for example, the IPO market), the conventional wisdom is that the book-building process solves a demand discovery problem (Benveniste and Spindt, 1989): Underwriters are not fully certain about the investor demand of a particular deal. They set the initial price (or rate) at their best estimate of how a deal would be received by the market, and adjust the price as they collect additional information from investors through book-building. To incentivize truthful information-sharing, the initial price is only partially adjusted, and hot deals are underpriced to compensate for investors who revealed their information (Hanley, 1993; Ritter and Welch, 2002; Corwin and Schultz, 2005; Ljungqvist, 2007). This demand discovery process also takes place in the underwriting of institutional loans, as shown by Bruche, Malherbe, and Meisenzahl (2020).

In this paper, we argue that the competition among potential underwriters is an overlooked factor that may lead the initial price to deviate from underwriters' best estimates, and thus underwriter competition predicts price adjustments. Under the assumption that an issuer *ceteris paribus* prefers an underwriter who proposes a lower interest rate, more intense underwriter competition could drive down the initial rate and make the subsequent rate adjustment more likely to

[1] The outstanding amount of institutional loans exceeds $1.5 trillion as of mid-year 2021. See `https://www.fitchratings.com/research/corporate-finance/institutional-loan-market-tops-1-5-trillion-hy-volume-exceeds-2019-pre-pandemic-levels-23-07-2021`.

be upward. Therefore, the rate adjustments observed in the underwriting process not only reflect the private information of investors discovered by the underwriter but are also affected by the competitive dynamic in the underwriter selection stage.[2]

To empirically investigate the effect of underwriter competition on the pricing and price adjustment of institutional loans, we assemble a sample of institutional loan deals from 2000 to 2020 where we observe their initial spreads, spread adjustments (flexes), and final spreads. One empirical challenge we face is that, as econometricians, we only observe underwriters who have actually won the mandate of a deal, but not the set of potential underwriter candidates. To measure the ex ante competitiveness of a given deal at the underwriting stage, we define segments of the institutional loan market based on credit ratings and industries of the borrower. We proxy for the competitiveness of a given segment using the number of unique underwriters that have recently worked in the segment or the Herfindahl-Hirschman Index (HHI) of underwriter market shares within each segment. Our assumption is that, rather than all underwriters competing for all loans, underwriters choose to specialize in certain industries and borrower risk profiles, creating a segmented loan market. Loan borrowers are known to be informationally opaque, and it pays off to specialize when information collection is costly (e.g., Kacperczyk, Sialm, and Zheng, 2005; Van Nieuwerburgh and Veldkamp, 2010). We provide descriptive statistics showing that our definition of market segments is sensible and that institutional loan underwriters indeed specialize.

We find that a higher level of underwriter competition, measured by a higher number of underwriters in the market segment or a lower HHI, is associated with lower initial spreads, controlling for credit ratings and deal characteristics. For example, a one standard deviation decrease in underwriter HHI is associated with a 5-basis-point reduction in initial spreads. Such a relationship is robust to the inclusion of underwriter-by-time fixed effects, suggesting that the result is not driven by the reputation and certification ability of individual underwriters. Instead, even when comparing two deals underwritten by the same bank, the initial spread is lower in the

[2]Another dimension where underwriters may compete is the underwriting fee. However, underwriting agreement in the institutional loan market is generally unobservable to researchers. Our informal conversations with some practitioners suggest that underwriting fees in the institutional loan market tend to be similar across deals in the 3-4% range.

market segment where there are more potential underwriters vying for the deal.

Intense underwriter competition pushes down the initial spread proposed by the winning underwriter but increases the probability that the initial spread needs to be adjusted upwards in the syndication stage. Consistent with our conjecture, we find in the data that a higher level of underwriter competition is associated with higher spread flexes (i.e., upward spread adjustments). Under our specification, this effect is effectively estimated by comparing two deals that have the same credit rating category, the same purpose, the same underwriter during the same quarter, and the same initial spread, but one deal's initial spread would have been higher if it were in the same segment as the other deal (i.e., same underwriter competition intensity). This empirical relationship is difficult to reconcile with the traditional view that price adjustments reflect only information production (Hanley, 1993; Lowry and Schwert, 2002; Bruche, Malherbe, and Meisenzahl, 2020), as the ex ante underwriter market structure should not contain new private information about the demand for a deal.

An endogeneity concern arises if the intensity of underwriter competition contains information about unobservable deal qualities in a given market segment. However, any alternative explanation must simultaneously account for the negative relationship between competition intensity and lower initial spread, which suggests more intense competition correlating with better deal qualities, and the positive relationship between competition intensity and higher flexes, which suggests more intense competition correlating with lower-than-expected investor demands. Nevertheless, we further mitigate endogeneity concerns using a quasi-exogenous shock.

Our identification strategy utilizes the insight that recent defaults of companies tarnish the reputation of the lead arranger who underwrote the defaulted companies' deals in the past (Gopalan, Nanda, and Yerramilli, 2011) and weakens the willingness and ability of the bank to compete for future deals (Murfin, 2012). As such, we hypothesize that the number of portfolio company defaults experienced by underwriters in a given market segment, even conditional on the defaulted companies being outside of the focal market segment, should weaken underwriter competition within the market segment going forward. Consistent with this conjecture, we find that the segment-level

number of portfolio company defaults positively predicts initial spreads, but negatively predicts spread adjustments in future deals. These findings strengthen our argument that underwriter competition affects loan pricing in a causal manner.

One key premise of the interpretation of the competitive effects we document above is that upward adjustments of deal spreads ("flex ups") are costly to deal underwriters. If this were not the case, underwriters would always be able to bid down the initial rate to an exceedingly low level and competition would not matter for underwriters' pricing decisions. To provide evidence for this mechanism, we take advantage of one feature of the institutional loan market, which is not as observed in the IPO market, that issuers typically have recurring borrowing demand or actively seek refinancing possibilities and hence interact with underwriters repeatedly.[3] We show that flex-ups are detrimental to underwriters in at least one particular way: borrowers are more likely to switch lead arrangers in the next deal if they experience upward flexes in the previous deal. Thus, the intuition of our findings is that underwriters trade off between bidding more aggressively initially to win a deal and the risk of flexing up afterwards, which is costly, and the intensity of competition affects the balance of this trade-off.

Interestingly, even though underwriter competition negatively affects initial loan rates and positively affects rate adjustments, the two forces do not exactly cancel out each other. We find that a lower initial spread due to higher underwriter competition is only partially reversed in the later book-building process, resulting in a lower spread in the final deal. Specifically, an interquartile increase in the log number of lead arrangers is associated with a 5.6 basis point reduction in the final spread on average, which implies $1.97 million dollars of savings on interest payments per loan deal given the average size and maturity of loans in our sample.

To better interpret the results on final spreads, we examine whether underwriter competition predicts post-issuance loan defaults after conditioning on final spreads. We find that higher final spreads are strongly associated with higher default likelihood, which is intuitive, but underwriter competition appears unrelated to default likelihood after controlling for final spreads. Hence,

[3] In our sample, the average time gap between the same borrower's two consecutive deals is 2.06 years.

though more intense underwriter competition leads to lower final spreads, it does not increase the non-priced default likelihood. These results are consistent with the interpretation that competition lowers underwriters' market power to charge markups and thus helps borrowers save on interest expenses. We further show that prior participation in an underwriter's deal does not increase the probability that an investor would participate in the underwriter's future deals, which indicates that borrowers' saving on interest rates thanks to more intense underwriter competition does not come with the cost of losing access to a superior investor network.

Additionally, we conduct analyses that show how the effect of underwriter competition on institutional loan pricing is mitigated by both uncertainty about investor demand and existing relationships between borrowers and underwriters. Uncertainty about investor demand exacerbates underwriters' downside risk of having to flex up in the book-building process. In anticipation, underwriters may refrain from competition when uncertainty is high. Consistent with this hypothesis, we find the pricing effect of underwriter competition is largely mitigated when demand uncertainty, as proxied by the standard deviation of flows to corporate loan mutual funds and CLOs, is relatively high. As for underwriter relationship, we argue that when borrowers choose to work with lead banks that they have established relationships with, it is more likely that the selection is determined by non-price dimensions of services. Consistent with this idea, we find that the pricing effect of underwriter competition is moderated for deals where the chosen underwriters have prior businesses with the borrowers.

Finally, we show that underwriter competition also affects non-price dimensions of institutional loans by looking at the adoption of the covenant-light feature in institutional-loan deals. The intuition is that underwriters may offer covenant-light deals that relinquish state-contingent controls in a bid to compete for borrowers. Consistently, we find in our data that deals are more likely to have the "cov-lite" feature in market segments where underwriter competition is more intense.

Taken together, our paper provides a conceptual framework and empirical evidence for how underwriter competition affects spread setting in the institutional loan market. Our paper con-

tributes to the literature in several ways. First of all, a strand of literature studies competition among underwriters in the context of IPOs and corporate bond offerings (for example, Corwin and Schultz, 2005; Fang, 2005; Ljungqvist and Wilhelm Jr, 2005; Ljungqvist, Marston, and Wilhelm Jr, 2006; Lyandres, Fu, and Li, 2018; Yasuda, 2005). The most related papers to our study are Hoberg (2007) and Liu and Ritter (2011). In Hoberg (2007), an informed underwriter and an uninformed underwriter (imperfectly) compete for mandates. In equilibrium, deals led by the informed underwriter account for most of the underpricing and partial adjustment phenomenon. Our paper focuses on how the competition of symmetrically informed underwriters affects loan spread through non-informational channels.

Liu and Ritter (2011) present a model where underwriters compete on both price and non-price dimensions. When the winning underwriters provides stronger non-price amenities (e.g., all-star analyst coverage), it is likely to offer less favorable pricing, resulting in more severe underpricing. Instead of inferring from ex post winning underwriters, our paper constructs ex ante competitiveness measures for different segments of the underwriter market and derive predictions of price setting and price adjustments for deals that might have been pursued by multiple underwriters.

Our paper also contributes to the understanding of pricing in the institutional loan market, a segment that has grown from 500 billion to 1.5 trillion dollars since the Global Financial Crisis. The literature has researched extensively on how loan prices are determined in this market. They find that information asymmetry (Ivashina, 2009), syndicate composition (Lim, Minton, and Weisbach, 2014; Cai, Eidam, Saunders, and Steffen, 2018), the retention decision of lead arrangers (Sufi, 2007; Ivashina and Scharfstein, 2010) and bank bargaining power (Santos and Winton, 2019) are important determinants of the loan spread. Few paper, however, pays attention to the syndication process itself. Two exceptions are Ivashina and Sun (2011) and Bruche, Malherbe, and Meisenzahl (2020). Ivashina and Sun (2011) look at the time a loan spends in syndication as a proxy for demand and show how it relates to spreads. Bruche, Malherbe, and Meisenzahl (2020) casts leverage loan syndication under the light of the demand discovery theory of Benveniste and Spindt (1989) and argue that spread adjustments (flexes) reflect private information underwriters collect

from investors. These papers focus on the syndication process after an underwriter has been selected. Our paper complements these studies in uncovering underwriter competition as another important factor in determining spread adjustments and final loan spreads.

II. Institutional Background

In this section, we discuss important characteristics of the institutional loan syndication process and discuss how the competition among potential underwriters may link to the pricing of institutional loans.

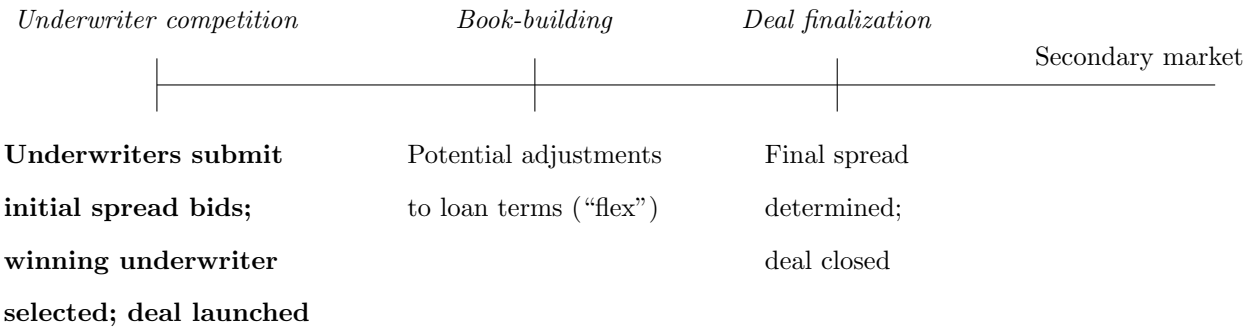
A. The institutional loan market

Since the early 2000s, institutional loan markets have enjoyed significant development. As shown in Panel (a) of Figure 1, the annual total volume of new issuance started increasing rapidly after the year of 2002 and first peaked before the 2008 financial crisis. After the crisis, institutional loans regained fast growth and reached a second, much higher peak in 2017. As of mid-year 2021, the total amount of institutional loans outstanding has topped $1.5 trillion in the U.S., according to Fitch. These loans are The credit rating of institutional loans is typically of speculative grade, the majority in the single B category, as shown in Panel (b) of Figure 1. Underwriters are thus essential for such lower-quality loan deals to obtain sufficient investor subscription in the syndication process.

We focus on underwritten deals in our study, in which the underwriter guarantees the committed loan amount and incurs costs if there is not enough investor interest.[4] As illustrated by Bruche, Malherbe, and Meisenzahl (2020), an underwritten deal starts with the borrower soliciting bids from potential underwriters (arrangers). Among the competing underwriters, the borrower chooses the winner, who is entitled underwriting fees and launches the deal in the primary market. The winning underwriter then seeks for institutional investors' subscriptions. If over- or under-

[4]Examples of other deal types include "Best-Efforts Deals"and "Club Deals".

subscription happens, the underwriter may adjust the deal terms ("flex") and conduct another round of book-running. When investor demand meets the committed loan amount, the deal is closed and trading of the loan on the secondary market commences. The sequence of events can be summarized as follows:



The key difference in our timeline as shown above from the one presented by Bruche, Malherbe, and Meisenzahl (2020) is the "underwriter competition" stage, which is the focus of our study.

Unlike their role in traditional syndicated loans, lead banks mainly serve as underwriters and use an originate-to-distribute model in the institutional loan market. Non-institutional tranches in our sample only account for about 10% of the loan amount. Even in deals where lead banks retain a nontrivial share of the loan, Blickle, Fleckenstein, Hillenbrand, and Saunders (2020) show that about half of the lead banks completely offload loans from their balance sheet immediately after the deal is closed. The competition among bidding underwriters and the overall deal structure make institutional loan syndication comparable to the process of public bond issuance and IPOs. In fact, in recent years, the majority of institutional loans do not contain maintenance covenants.[5] Some academics and practitioners argue that this asset class is more similar to bonds than to traditional corporate loans from both the borrower's and lender's perspective (Prilmeier and Stulz, 2019).

[5]From 2015 to 2020, the proportion of institutional loans originated as "covenant-light" in terms of volume stayed above 70%.

B. How underwriter competition may affect loan pricing

At the underwriter competition stage, potential lead arrangers may offer different interest rates in a bid to win the underwriting mandate. The key premise of this paper is that, all else equal, borrowers would prefer to choose an underwriter who offers a lower rate on their loans. From the perspective of the borrower, underwriters are better informed about the market demand for the deal, and a low initial rate may represent a bona fide favorable assessment of the borrower's capital raising.

From the perspective of a prospective underwriter, there are two price considerations: (i) the initial bid and (ii) the potential need to adjust the initial price in the book-building process should it win the deal. In theory, assuming that no new information is expected to arrive between the initial bidding stage and price-adjustment stage, then for any underwriter, bidding lower initially helps win the deal and thus the underwriting fees, but it naturally increases the likelihood of adjusting the spread upwards since the underwriter is obliged to find enough institutional investors for the deal and those investors tend to prefer better yields. If upward spread adjustments are costless to the underwriter, then the underwriter may find it optimal to bid the lowest possible rate initially regardless of the level of competition. If, instead, the underwriter derives disutility from upward spread adjustments, then it faces a meaningful trade-off: a slightly lower initial bid increases the expected utility from underwriting fees, but expected disutility also increases due to the higher likelihood of upward spread adjustments. In this case, the intensity of underwriter competition is likely to affect loan pricing since it determines how sensitive the winning probability is to the same marginal decrease in the initial bid.[6] Which of these two cases is more plausible, and hence whether underwriter competition affects institutional loan pricing, is then an empirical question we investigate in the data.

[6]We formulate this interesting case in a simple model, which we show in Internet Appendix A.

III. Data

We construct a sample of institutional loan deals using multiple data sources, including S&P's Leveraged Commentary and Data (LCD) and Loan Pricing Corporation's (LPC) DealScan database.

A. Sample Construction

We begin by collecting all institutional loans from LCD, which covers 14,469 deals from January 1, 2000 to September 15, 2020. We require our sample deals to have non-missing information on spreads and borrowed amount, resulting in 20,460 facilities from around 11,000 deals issued by 4,246 distinct issuers. Each deal consists of one or more facilities, and each facility is categorized as either "pro-rata" or "institutional". An institutional facility (term loan B, C, D) is a term loan facility designed for non-bank institutional investors. Such tranches are different from pro-rata tranches (revolving credit, term loan A), which are traditionally funded by banks. Our analyses only include institutional tranches, where lead arrangers play a key role in underwriting deals and soliciting investments from institutional investors. In our sample, institutional tranches account for 85% (89%) of the funding for an average (median) deal. We further drop second-lien facilities and all subordinated loans.

We define an underwriter (lead arranger) of a deal as bank(s) designated as the administrative agent ("LenderRole") in DealScan, and the rest of the lenders for the same package are treated as participants (Levine, Lin, Wang, and Xie, 2018). For loans without a specified administrative agent, lenders that serve as Agent, Co-Agent, Lead Arranger, Lead Managers, or received Lead Arranger League Table credit ("LeadArrangerCredit" has a value of "Yes") are identified as the lead arrangers. Furthermore, we hand-collect underwriter information and group underwriters to their management firm level.

One of our key variables is related to adjustments to spread and original issue discount (OID) during the syndication process, which are generally called "flex". Since these spread adjustments (flexes) only happen to institutional facilities, we drop non-institutional tranches from our sample

and restrict our deals to those that have at least one institutional facility. This criterion lowers sample size to around 9,300 deals and 10,520 institutional tranches. We obtain initial spreads and flexes as well as other loan characteristics including facility type, original issue discount (OID), rating, issuance date, sponsor status, and whether they were covenant-lite from LCD. We next collect maturity and underwriter information from LPC DealScan database by manually matching borrower company names between DealScan and LCD databases. This procedure yields a sample that covers 8,354 deals.

Finally, we require that all key loan contract terms be available, including the initial spread, borrowed amount, maturity, and underwriter information. Overall, our final sample consists of 8,440 institutional tranches from 7,505 institutional loan deals issued by 3,440 distinct borrowers between 2000 and 2020, among the 7,505 loan deals, 6,919 are single-underwriter deals, and 586 are multiple-underwriter deals.

B. Data description

Panel A of Table I provides summary statistics for the 7,505 deals in our sample. We aggregate loan characteristics such as initial spread, initial OID, and maturity of each facility to deal level, by taking value-weighted average based on facility size across all facilities. We also aggregate loan size to the deal level by summing facility-level borrowed amount within a deal. The average deal in our sample has an initial spread of 361 basis points and a maturity of 6.06 years.

One of our main independent variables relates to adjustment on spreads and OID discounts ("flexes"). A higher flex indicates adjustments towards a higher interest rate on loan deals. We follow Bruche, Malherbe, and Meisenzahl (2020) in combining both spread flex and OID flex in a single variable called *effective spread flex*.

$$Effective\ Spread\ Flex \equiv Spread\ Flex + \frac{OID\ Flex}{Maturity\ (in\ years)}. \tag{1}$$

This calculation amortizes OID discount over loan maturity. Noted that, for deals with multiple

institutional tranches (and hence multiple flexes), we aggregate spread flex and OID flex to the deal level by calculating the facility-amount-weighted average flex across all institutional facilities within the deal. For institutional facilities with a missing value of flex, we replace it with zero by assuming that no reported flexes means zero adjustment to spread and OID. Among our sample of 7,505 deals, 2,143 (28.55%) deals are flexed down (negative effective spread flex), 1,132 (15.08%) deals are flexed up (positive effective spread flex), and 4,230 (56.36%) deals are not flexed.

Using the DealScan-Compustat link provided by Chava and Roberts (2008), we collect financial information (e.g., total assets, return-on-assets, leverage) from the merged CRSP/Compustat database for each issuer. Borrowers with no publicly-traded securities generally do not have records in the merged CRSP/Compustat database. For each deal in our sample, we set a dummy variable $D(borrowerisprivatefirm)$ which equals one if the borrower of the deal is not identified in Compustat.

C. *Defining underwriter competition*

Due to the limitation of data, we only observe underwriters who actually win the mandate of a deal, but not the set of potential underwriters who have participated in the bidding. To measure the ex-ante competition between potential lead arrangers of a given deal, we use a methodology similar to Manconi, Neretina, and Renneboog (2018) in defining market segments in the institutional loan market based on credit rating and issuer industries.[7] Specifically, we categorize all loan deals into five groups based on their credit ratings (i.e., BB+ or above; B+; B; B- or C; not rated) and 12 groups based on their Fama-French 12 industry classifications. Effectively we construct $5 \times 12 = 60$ rating-industry buckets, which we call "market segments".[8]

To illustrate that this is a sensible market-segment definition, we first calculate two statistics

[7] Manconi, Neretina, and Renneboog (2018) define segments of the bond underwriting market based on credit rating, bond maturity, and issuer industries. We do not consider loan maturity in our definition of market segments because loan maturities are relatively uniform in our sample.

[8] In terms of the total number of deals, among credit rating categories, "B" is the largest (2,151 deals), followed by "BB or above" (1,638 deals) and "Not Rated" (1,576 deals), and among industries, the largest is "Other: Mines, Construction, Building Management, Transportation, Hotels, Bus Service, Entertainment" (1,770 deals), followed by "Wholesale, Retail, and Some Services (Laundries, Repair Shops)" (979 deals). Internet Appendix Table IA1 shows more details about the number of deals by credit rating and by industries; it also lists the top 10 segments.

at the end of each quarter for each segment based on data from the most recent eight quarters. One is the total number of deals underwritten, which represents the segment-quarter level loan activities; the other is the total number of unique underwriters that have underwritten at least one deal, which represents the segment-quarter level underwriter participation. Figure 2 provides the distribution of these two statistics in our sample. Panel (a) shows that, though some segments may be much bigger in terms of loan activities (e.g., those observations with more than 30 deals in a quarter), the overall distribution of segment-level activities in our sample is quite continuous and normal. In particular, it is not the case that a small number of large segments dominate the market (which should yield a bimodal pattern). Similarly, the distribution of underwriter participation shown in Panel (b) suggests that the activeness of underwriters is comparable across segments. We also confirm that the patterns shown in Figure 2 are representative of different sample periods.[9]

One underlying assumption of our market-segment definition is that underwriters have certain levels of expertise in underwriting deals within a market segment. In other words, it is somewhat difficult for a lead arranger to "deviate" and compete for a deal in a segment where the lead arranger has not underwritten a deal in the past. We show the validity of this assumption through an additional sample statistic — for each segment at the end of each quarter, we use data from the past 8 quarters to calculate the total number of unique underwriters both within this segment and across all segments and obtain the ratio of the former over the latter. If there is no "entry barrier" for underwriters to do business in a new segment, then presumably any underwriter should participate in most segments, which implies that the ratio should be quite close to 1 most of the time. If underwriters generally specialize in certain segments instead, the ratio should be low most of the time. Panel (a) of Figure 3 shows the distribution of the ratio we calculated across segment-quarters. Indeed, the vast majority of observations have a value below 0.3, with more than half below 0.15 (which means no more than 15% of active underwriters in the market participate in a given segment).

[9] We plot these distributions separately for four sample periods: 2002-2006; 2007-2011; 2012-2016; and 2017-2020. We show the results in the Internet Appendix Figure IA1 and Figure IA2.

Another implicit assumption behind measuring underwriter competition at the segment level is that the market overall is not always dominated by a small set of specific underwriters. We show this through the following sample statistic: for each underwriter at the end of each quarter, we use data from the past 8 quarters to obtain its rank in terms of total loan volume underwritten in each segment and count the number of segments in which the underwriter ranks the top. Panel (b) of Figure 3 shows the distribution of this statistic. The vast majority of observations have a value not larger than 1, which means an underwriter in general can be dominant in no more than one segment. In addition, the frequency of observations decays exponentially to a minimal level after the value of 15, which indicates that there does not exist a specific set of extremely dominant underwriters and that underwriters do not exhibit universal dominance across segments even at times when they appear very influential in the market.

We confirm that the distribution patterns shown in Figure 3 are representative of different time periods.[10] Moreover, we further calculate that, for underwriters that underwrite at least ten deals (45 unique underwriters) in our sample, the most frequent (top three) industry for an underwriter accounts for 34.4% (66.5%) of its businesses in terms of deal volume, and the top (top three) credit rating category for an underwriter accounts for 46.1% (88.3%) of its businesses. These empirical patterns are also consistent with our notion that underwriters specialize in certain market segments.

Using our definition of market segments, we construct the measure for underwriter competition. At each quarter for each market segment, we measure the intensity of competition using two variables: *Number of underwriters* and *Underwriter HHI*. *Number of underwriters* counts the number of unique underwriters who underwrote deals in the previous 2 years or 5 years. Intuitively, a larger number of banks who were active in a given market segment indicates a potentially more competitive underwriter market segment. *Underwriter HHI* measures the HHI index calculated from underwriter market shares in each segment (indexed by J) to proxy for competitiveness.

[10] We plot those distributions separately for four sample periods: 2002-2006; 2007-2011; 2012-2016; and 2017-2020. We show the results in the Internet Appendix Figure IA3 and Figure IA4.

$$HHI_J = \sum_{i \in J} (x_i / \sum_{i \in J} x_i)^2 \tag{2}$$

We further construct a measure that shocks the intensity of underwriter competition in a plausibly exogenous way. *Underwriter portfolio company defaults* measures the number of recently-defaulted companies that a bank underwrote in the past, aggregated across all underwriters in a given market segment. Next, we demean this variable by subtracting segment averages to remove the segment fixed effects for the entire sample period.

Panel B of Table I shows the summary statistics for the competition measurements. The average segment-quarter in our sample has 10.1 distinct underwriters in the previous two years, and 14.2 distinct underwriters in the previous five years. The average segment-quarter has an underwriter HHI of 0.262 (last two years) and 0.204 (last five years), indicating a relatively high concentration level in the underwriting market for institutional loans.[11]

IV. Empirical results

In this section, we first examine whether underwriter competition is significantly related to institutional loans' initial spreads and spread adjustments. We then look at borrowers' decisions to switch underwriters from one deal to the next to help illustrate the mechanism. We further show how underwriter competition is related to final spreads and post-issuance default likelihood. Finally, we show whether underwriter-investor relationships matter for borrowers' access to capital to help discuss whether more intense underwriter competition is beneficial to borrowers.

A. Underwriter competition and initial spreads

The intuitions discussed in Section II unambiguously imply an inverse relationship between the intensity of underwriter competition and the initial spread of an institutional loan, conditional on observable loan characteristics. To empirically test this, we estimate the following equation:

[11] As a point of reference, DoJ defines an industry HHI exceeding 0.25 as a "high level of concentration".

$$\textit{Initial spread}_{i,t} = \alpha_t + \beta\, \textit{Underwriter competition}_{m,t-1} + \gamma Z_{i,t} + \epsilon_{i,t} \tag{3}$$

where subscript m denotes the market segment (defined by borrower industry and credit rating) Deal i' belongs to. $Z_{i,t}$ denotes a vector of loan and segment characteristics, including an indicator for whether the borrower was a first-time borrower, the logarithm of the deal maturity, the logarithm of the deal amount, an indicator for CovLite deals, an indicator for sponsored deals, the logarithm of the number of deals the borrower has worked with the same underwriter previously, an indicator of whether the borrower is a private or public company, the proportion of private borrowers in the segment m, and the underwriter's market share in the segment m.

We proxy for the intensity of underwriter competition in a given segment-quarter using two variables: *Number of underwriters (logarithm)* and *Underwriter HHI*. When we use the number of underwriters, the coefficient β is predicted to be negative; when underwriter competition is captured by underwriter HHI, β is predicted to be positive.

Columns 1-3 of Table II show the results of estimating the initial spread regression using the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. This variable takes a larger value when there are more banks potentially available to serve as the underwriter in a market segment, intensifying the competition. Consistent with our theoretical prediction, we find a significantly negative relationship between the logarithm of the number of segment-level lead arrangers and the initial spread of a deal, conditional on deal characteristics. Under the specification with time fixed effects, loan-purpose fixed effects, and loan-credit-rating fixed effects (i.e., Column 1), an interquartile change (0.77) in the log number of lead arrangers over the past two years is associated with a 6.6 basis point change in the initial spread of a loan.

In Columns 2-3 of Table II, we further, respectively, control for lead arranger fixed effects and lead arranger-by-time fixed effects. Under these specifications, we are effectively comparing deals underwritten by the same lead arranger but in different market segments. In one of the segments, there are fewer banks who have served as lead arrangers; in another segment, there are

more potential underwriters. The negative coefficient on the segment-level number of underwriters suggests that the initial spread is lower for the deal in the market segment with fewer potential lead arrangers. These specifications, together with the fact that we control for the underwriter's market share in the segment, mitigate the concern that our results are partially driven by the variation in underwriters' abilities to provide certification for loan deals. In addition, the significantly negative coefficient on the underwriter's market share is consistent with what Fang (2005) finds for bond underwriting — reputable banks obtain lower yields for issuers — since an underwriter with a higher market share tends to be more reputable.[12]

In Columns 4-6 of Table II, we regress the initial spreads of deals on segment-level underwriter HHIs, with the same set of control variables as those in Columns 1-3. A lower HHI indicates a more competitive market segment. We find a positive and significant relationship between underwriter HHI and initial spreads. This positive relationship between underwriter HHI and initial spreads is robust to the inclusion of time fixed effects, loan-purpose fixed effects, loan-credit-rating fixed effects, and underwriter-by-time fixed effects.[13]

Figure 4 visualizes the relationship between underwriter HHI and loan spreads across market segments. In obtaining Figure 4, we residualize the initial spreads of loans to absorb differences in deal characteristics across segments. Specifically, we run the following regression:

$$Initial\ spread_{i,t} = \beta X_{i,t} + timeFE + \epsilon_{i,t}, \tag{4}$$

where the vector of loan characteristics X includes credit rating, a first-time borrower indicator, the logarithm of loan maturity, the logarithm of loan amount, a cov-lite indicator, a sponsored-deal indicator, and a private borrower indicator. The residualized initial spreads are then averaged

[12] We repeat these analyses using the number of segment-level lead arrangers in the past five years (instead of two years) to proxy for competition and the results are similar. We show the results with the most saturated fixed effects in Column 1 of the Internet Appendix Table IA2.

[13] One potential concern of our tests shown in Table II is that we do not control for enough borrower characteristics. To address this concern, we map our deal sample with the CRSP/Compustat merged database to extract three additional fundamental variables for public firms: total assets, return on assets, and leverage. We run the same tests by adding these variables as additional controls, where we include private firms by imputing zeros for them. Our results on initial spreads are robust to adding these controls, as shown in Column 1 of the Internet Appendix Table IA3.

within a market segment.

Consistent with our regression results, Figure 4 shows that there is a positive relationship between segment-level underwriter HHI and the average initial spread for loans within a segment.

B. Underwriter competition and spread adjustments

We then proceed to test if underwriter competition also affects spread adjustments (flexes) during the book-building process. We use *Number of underwriters (logarithm* and *Underwriter HHI* as proxies for underwriter competition within a specific market segment. The outcome variable is spread adjustments measured in three different ways: (1) *Discrete flex (-1, 0 ,1)*, which takes the value of 1 for deals that adjust spreads upward, -1 for deals that adjust spreads downward, and 0 for deals without spread adjustment; (2) *D(Flex up)*, an indicator for deals with upward spread adjustments; and (3) *Effective spread flexes*. We estimate the following equation:

$$Spread\ adjustments_{i,t} = \alpha_t + \beta\, Underwriter\ competition_{m,t-1} + \gamma Z_{i,t} + \epsilon_{i,t}, \tag{5}$$

where $Z_{i,t}$ is a vector of deal and segment characteristics. We also include the initial spread in the set of controls.

Columns 1, 3, and 5 of Table III show the results when the proxy for underwriter competition is the number of lead arrangers in a given market segment in the past two years. We find a positive and significant relationship between the log number of lead arrangers that have underwritten deals in the market segment and spread adjustments. Column 1 shows that an interquartile change (0.77) in the log number of lead arrangers over the past two years is associated with a 3.18 percentage point increase in the probability that a deal is flexed up or not flexed down. This effect is economically meaningful, as only 15.1% of the deals in our sample are flexed up and 28.5% of the deals in our sample are flexed down. Moreover, when we switch to the indicator for flexing up in Column 3, we find that much of the effect of underwriter competition is reflected by a change in the probability of flexing up. In Column 5, the outcome variable is the continuous measure of

effective spread flexes, and the coefficients suggest that the number of segment-level underwriters is positively associated with spread adjustments. The relationship between the logarithm of the number of lead arrangers and flexes is robust to the inclusion of underwriter-by-time fixed effects, indicating that even underwriters with a good reputation are not immune to the impact of underwriter competition.[14]

Columns 2, 4, and 6 of Table III show results of the same analysis using instead the HHI of each market segment as the proxy for the intensity of underwriter competition. We find a negative and statistically significant relationship between underwriter HHI and effective spread flexes, which is consistent with the results shown in Columns 1, 3, and 5. In particular, a higher segment-level underwriter HHI measured during the past two years is negatively associated with the probability of a deal being flexed up (Column 4). It is also negatively associated with effective spread flexes (Column 6).[15]

In all columns, one coefficient that may appear to stand out is the one on the initial spread, which is positive and statistically significant. Our interpretation is that this coefficient captures the "hot deal" perspective, which is beyond the underwriter's decision framework discussed in Section II. Specifically, loan deals that are very attractive to investors (e.g., due to the borrower's good quality) tend to both have lower initial spreads and be less likely to report flex-ups compared to loan deals with cooler investor demand. In fact, this perspective is why controlling for the initial spread is necessary. In other words, in these spread-adjustment regressions, the effect of underwriter competition on flexes is estimated by comparing two deals that have the same credit rating category, the same purpose, the same underwriter during the same quarter, and the same initial spread, but one deal's initial spread would have been higher if it were in the same segment as the other deal (i.e., same underwriter competition intensity).

[14]Results are robust if we use the logarithm of the number of underwriters based on the past five years instead of two years. We show them in Columns 2-4 of the Internet Appendix Table IA2.

[15]We address the potential concern of not controlling for enough borrower characteristics by mapping our deal sample with the CRSP/Compustat merged database to extract three additional fundamental variables for public firms: total assets, return on assets, and leverage. We run the same tests by adding these variables as additional controls, where we include private firms by imputing zeros for them. Our results on spread adjustments are robust to adding these controls, as shown in Columns 2-4 of the Internet Appendix Table IA3.

Lastly, as argued by Bruche, Malherbe, and Meisenzahl (2020), spread adjustments are also driven by investor demand for the deal that underwriters failed to account for initially. Therefore, an alternative explanation for our results is that the intensity of underwriter competition covary with investor demand for a specific market segment. If this is the case, however, the confounding story suggests that the market segments with cooler investor demand (and hence experience more flex-ups) tend to be more competitive among lead arrangers. This suggests a lack of rationality from underwriters' perspective and does not seem likely. Nevertheless, we further mitigate the concern of endogeneity by employing plausible variations in the intensity of underwriter competition and examining their impact on the initial spread and spread adjustments.

C. Exogenous shocks to underwriter competition and spread adjustments

In this subsection, we aim to show that the effects of underwriter competition on initial spreads and spread adjustments of institutional loans are likely causal by taking advantage of plausibly exogenous shocks that affect the intensity of competition within a given market segment. The shocks that we utilize are recent default events of companies that a lead arranger underwrote in the past. This is in the spirit of Gopalan, Nanda, and Yerramilli (2011), who document that lead arrangers that lent a significant amount of loans to bankrupt borrowers relative to their total underwritten amount are less able to attract syndicate participants, presumably due to damages in reputation, and Murfin (2012), who uses the number of defaults in a lender's portfolio companies as a negative shock to the lender's willingness and ability to supply capital in the loan market.

In particular, for any lead arranger in a given segment, we consider the recent defaults on loans underwritten by this lead arranger in other segments that have credit ratings higher than or equal to the focal segment. This separation by credit rating is motivated by the theoretical framework for loan sales and securitization. For example, Parlour and Plantin (2008) illustrates a negative relationship between loan-trading liquidity and credit quality, which stems from the issue of adverse selection. Daley, Green, and Vanasco (2020) shows that informative credit ratings facilitate the originate-to-distribute model by weakening the signaling effect of lead arrangers'

loan retention. Thus, in our institutional loan sample, an underwriter involved in defaults from higher-rated loan segments should expect increased difficulty in soliciting investor participation in the focal segment due to investors' exacerbated concerns about the underwriter holding back private information and the informativeness of credit rating for the underwriter's future deals. This makes the underwriter less willing and able to compete in the focal segment.[16]

The following example illustrates details of our default-shock calculation. Suppose Lead Arranger A is considered a potential underwriter for deals underwritten in Segment S (the focal segment). If A underwrote a loan for Company X in segment S' that has a higher or equal credit rating than S, we track the default status of Company X. If Company X defaulted on its loan in the recent year, we keep this default event on the tally for Lead Arranger A for the focal segment S. We aggregate the number of recent default events across all underwriters that appeared in a given market segment in the past two years.[17] Intuitively, if more underwriters who could otherwise compete for underwriting mandates are negatively impacted by portfolio company defaults, the competitiveness of any upcoming deals in this market segment would be weakened. Importantly, we only count default events outside of focal market segment. Therefore, the number of recent defaults in underwriters' past borrowers is unlikely to be correlated with the creditworthiness of companies seeking new institutional loans in a given market segment. Our baseline results show that weakened competition among underwriters is associated with higher initial spreads and lower flexes during the book-building process. Thus, we expect a positive β coefficient from estimating

[16]This intuition is similar to the "reputation hypothesis" in Gopalan et al. (2011). Defaults from lower-rated segments, in contrast, should not have such effects under the same theoretical framework because lower-rated deals have more severe adverse selection issues to begin with. In fact, defaults from lower-rated segments may trigger investors' flight-to-quality behavior and thus make involved underwriters more willing to compete in the focal segment, which we confirm in unreported results.

[17]Following the methodology of Murfin (2012), we demean the number of portfolio company defaults by subtracting the time-series average within each market segment. Such adjustment takes care of the issue that larger market segments, which have a higher number of participating lead arrangers, would naturally experience more portfolio company defaults.

the following equation:

$$\begin{aligned} \textit{Initial spread}_{i,t} = \alpha_t + \beta\, \textit{Underwriter portfolio company defaults}_{m,t-1} \\ + \delta\, \textit{Underwriter competition}_{m,t-1} + \gamma Z_{i,t} + \epsilon_{i,t}, \end{aligned} \tag{6}$$

and a negative β coefficient from estimating the following equation:

$$\begin{aligned} \textit{Effective spread flex}_{i,t} = \alpha_t + \beta\, \textit{Underwriter portfolio company defaults}_{m,t-1} \\ + \delta\, \textit{Underwriter competition}_{m,t-1} + \gamma Z_{i,t} + \epsilon_{i,t}, \end{aligned} \tag{7}$$

where underwriter competition, proxied by either *Number of underwriters (logarithm)* or *Underwriter HHI*, controls for the baseline level of competition intensity before taking into account the exogenous shock.

Table IV shows the results from estimating the above models. Consistent with our prediction, the coefficient on underwriter portfolio company defaults is significantly positive (negative) when the initial spread (effective spread flex) is the outcome variable. These results indicate that a plausibly exogenous relaxation of underwriter competition increases initial spreads and reduces the upward adjustment of loan spreads during book-building. This is consistent with an explanation centered on underwriter competition, as lead arrangers who are weakened by company defaults are less likely to compete aggressively for future underwriting mandates. As a result, the winning underwriter is less likely to have "over-bidden" on the deal and subsequently forced to adjust the spread upwards.

The negative relationship between underwriter portfolio company defaults and spread adjustments mitigates the concern that recent defaults of underwriter portfolio companies capture borrower creditworthiness of upcoming deals, notwithstanding the fact that we only count defaults outside of the focal market segment and the finding that initial spreads become higher. If underwriter portfolio company defaults are correlated with borrower fundamentals, then a higher number of recent defaults should indicate worse deal qualities for new loans in the market segment

as perceived by investors. As a consequence, one should expect investors to take the higher initial spreads with as much or even more occurrence of upward spread adjustments during the demand discovery process of book-building. In other words, this alternative story should bias us from finding a negative β coefficient when the outcome variable is the effective spread flex.

In summary, recent default events of companies that a lead arranger underwrote in the past weaken the ability of the lead arranger to underwrite new deals, weakening underwriter competition. Our results suggest that deals undertaken under such circumstances are associated with higher initial spreads and lower spread adjustments. We interpret this result as a reaffirmation that underwriter competition has a material impact on how loan spreads are set and adjusted in the book-building process.

D. Spread adjustments and future underwriter switches

We have argued that the intensity of competition appears to have a causal effect on institutional-loan underwriters' pricing strategies at both the initial bidding stage and the price-adjustment stage. As discussed in Section II, one key premise of the mechanism is that upward adjustments of deal spreads ("flex ups") are costly to deal underwriters. Suppose, instead, that underwriters can flex up a deal without any costs, then they may find it optimal to always bid aggressively low initially, regardless of the intensity of competition. In fact, knowing that underwriters may be free to flex up the rates later, borrowers are not likely to find underwriters' initial bids credible, which effectively annihilates price competition. Hence, for competition to matter for underwriters' pricing decisions, it must be the case that underwriters face a trade-off between bidding too low initially to win the underwriting mandate and increasing the likelihood of flexing up which is costly. Competition affects the balance of this trade-off and thus underwriters' pricing decisions.

In the institutional-loan market, issuers typically have recurring borrowing demand or actively seek refinancing possibilities and hence interact with underwriters repeatedly — in our sample, the average time gap between the same borrower's two consecutive deals is 2.06 years. We take advantage of this feature and show that flexing up the rate of an institutional-loan deal can be

detrimental to an underwriter in at least one particular way: borrowers are more likely to switch lead arrangers in the next deal if they experience upward flexes in the previous deal.

We assemble a subsample of 4,190 deals where the borrowers had a previous institutional loan deal in our full sample. In other words, our tests are effectively based on 4,190 pairs of deals. The outcome variable of interest is $D(\textit{Underwriter Switch})$, which is set to one if the underwriter a borrower uses for the current deal is different from the underwriter it uses for the previous deal. In a small number of deals where there are multiple lead arrangers, this binary variable is set to one only when none of the current deal underwriters coincides with the previous deal's underwriter(s). On average, 30.8% of the 4,190 deals switch their underwriters.[18] We then estimate the following regression:

$$D(\textit{Underwriter switch})_{i,t} = \alpha_t + \beta \textit{Effective spread flex}_{i,t-1} + \gamma Z_{i,t-1} + \epsilon_{i,t} \tag{8}$$

where the key explanatory variable *Effective Spread Flex* is the spread adjustments in the previous deal of the same borrower. $Z_{i,t-1}$ denotes a vector of characteristics of the previous deal, including the final spread of the deal, an indicator for whether the borrower was a first-time borrower on the previous deal, the logarithm of the deal maturity, the logarithm of the deal amount, an indicator for Covlite deals, an indicator for sponsored deals, the logarithm of the number of deals the borrower has worked with the same underwriter (including the previous deal in the deal pair), the logarithm of the number of years between the current deal and the borrower's previous deal, and an indicator of whether the borrower is a private or public company.

We estimate the above equation using a linear probability model to accommodate for multiple fixed effects.[19] The results of this regression are shown in Table V. In Column 1, we find a positive and statistically significant coefficient on the effective spread flex, suggesting that borrowers are more likely to switch underwriters following a deal in which the spread was adjusted upwards

[18] This average propensity of switching underwriters is similar to the probability of underwriter switch documented in other markets. For example, Ljungqvist and Wilhelm Jr (2005) show that 35.9% of SEO deals have a different underwriter from IPOs.

[19] The results are robust if we use a Probit model with only time fixed effects.

in the book-building process. In terms of economic magnitude, a 100 bp flex up is associated with a 6.5 percentage point increase in the probability of underwriter switches. In Column 2, we further control for fixed effects for loan purposes and fixed effects for loan ratings. The positive relationship between spread flexes and underwriter switching is little changed.

We also use alternative versions of spread flex to illustrate the relationship between flexes and switching. In Columns 3 and 4 of Table V, we use a discrete flex indicator that converts upward flexes into 1, downward flexes into -1, and no flex into 0. The coefficient estimates suggest that going from no flex to positive flexes (or from downward flexes to no flex) increases the probability of underwriter switching by 3.46 to 3.67 percentage points. These estimates are statistically significant at the 1% level and suggest that our results are not driven by extreme values in spread adjustments.

In Columns 5 and 6 of Table V, we further examine the effect of a binary variable indicating whether a deal is flexed up (i.e., upward spread adjustment). The coefficient on *D(Flex up)* suggests that flexed-up deals have a 3-percentage-point higher probability of switching underwriter. This economically large effect also suggests that, for underwriters, the potential cost of flexing up is likely to be higher than the potential benefit of flexing down. This is consistent with the institutional features in the institutional loan market that flexing up is often associated with a reduction of underwriter fees, while flexing down usually is not tied to additional compensation to the underwriters (Bruche, Malherbe, and Meisenzahl, 2020).

It should be noted that the positive relationship between spread flexes and underwriter switch is obtained after controlling for the final spreads of the previous deals. This suggests that borrowers hold flex-ups against underwriters even conditional on the final interest rate of their loans. While we are agnostic on the underlying driving force of such underwriter switches, the predictive power of flexes on future underwriter switches validates a key assumption of our paper and imposes an important constraint on underwriters' strategies in bidding for underwriting mandates.

Other coefficient estimates reported in Table V are also informative about borrowers' considerations in choosing underwriters. For example, borrowers are less likely to switch underwriters if

their current underwriter just placed a large or long-maturity loan for them in the previous deal. Relationships between borrowers and underwriters also play an important role. The probability of an underwriter switch is decreasing in the strength of the relationship between borrowers and their current underwriter. On the other hand, an underwriter switch is more likely when there is a longer time gap between the previous deal and the upcoming deal.

E. Underwriter competition, final spreads, and default likelihood

Having established the effects of underwriter competition on both the initial spreads and spread adjustments of institutional loan deals, we now examine the "net effect" — whether the intensity of underwriter competition affects the final spread of loan deals. While more intense underwriter competition pushes down initial spreads and drives up rate adjustments in the book-building process, the rate adjustments may not completely offset the pricing effect of competition. Therefore, It is important to examine empirically the pricing effect of underwriter competition because it is directly related to borrowers' cost of debt.

We run the following regression to estimate the effect of underwriter competition on the final spread of loan deals:

$$Final\ spread_{i,t} = \alpha_t + \beta\, Underwriter\ competition_{m,t-1} + \gamma Z_{i,t} + \epsilon_{i,t}, \tag{9}$$

where $Z_{i,t}$ is a vector of deal and segment characteristics.

Columns 1-2 of Table VI show the results from the above estimation. A higher number of lead arrangers in a given segment-quarter, which indicates more intense competition, is associated with a lower final yield spread on the loan deal. In particular, the estimate in Column 1 suggests that an interquartile increase (0.77) in the log number of lead arrangers over the past two years is associated with a 5.96-basis-point reduction in the final spread of a loan, after controlling for loan-purpose fixed effects, loan-rating fixed effects, and arranger-by-time fixed effects.[20] Results

[20]This estimated association is stronger if we measure competition using the number of lead arrangers over the past five years instead of two years, which we show in Column 5 of the Internet Appendix Table IA2.

are similar if we use HHI as the measure for underwriter competition intensity (Column 2) — a more concentrated market segment, indicated by a higher HHI, is associated with significantly higher final spreads.[21]

Past studies have looked at how loan spreads are affected by the geographical location of the loan market (Carey and Nini, 2007), information asymmetry within the syndication (Ivashina, 2009), bank capital and borrower bargaining power (Santos and Winton, 2019), and investor demand (Ivashina and Sun, 2011). In our setting, there are two alternative interpretations for the results on final spreads: (1) more intense underwriter competition lowers loan prices to levels that do not sufficiently reflect potential credit risk; (2) the industrial organization of loan underwriters plays an important role in determining the pricing of institutional loans, where more intense competition lowers underwriters' market power to charge markups. To see which interpretation is more plausible, we examine whether underwriter competition predicts post-issuance loan defaults after conditioning on final spreads. The first interpretation calls for a positive relationship between underwriter competition intensity and future defaults, while the second interpretation means there should be no such predictability.

Specifically, we track our sample deals' default status within three years and five years after their issuance, respectively, and create two corresponding default indicators, *D(Default in 3 years)* and *D(Default in 5 years)*. Using these two indicators as outcome variables, we test for their relationship with underwriter competition. Besides the control variables and the most saturated fixed effects we imposed for previous tests, we add the final spread as an additional control. Results are shown in Columns 3-6 of Table VI. In all of these four columns, the measure of underwriter competition shows a coefficient that is insignificant both statistically and economically, while the coefficient on the final spread is statistically significant at the 1% level, economically meaningful, and uniformly positive. In other words, higher final spreads are strongly associated with higher default likelihood, which is intuitive, but underwriter competition appears unrelated to default

[21] We run the same tests by adding total assets, return on assets, and leveraged as additional control variables, where we include private firms by imputing zeros for them. Our results on final spreads are robust to adding these controls, as shown in Column 5 of the Internet Appendix Table IA3.

likelihood after controlling for final spreads. Hence, though more intense underwriter competition leads to lower final spreads, it does not increase the non-priced default likelihood. These results are consistent with the interpretation that competition lowers underwriters' market power to charge markups and thus helps borrowers save on interest expenses.

F. Underwriters' relationship with investors

As discussed in previous sections, in the institutional loan market, borrowers rely on underwriters to find enough investors for financing the loans. Hence, a way underwriters may distinguish themselves from competitors is through their investor networks — the more well-connected an underwriter is, the better access to capital it could help provide the borrowers with. We have shown that more intense underwriter competition benefits borrowers by lowering the final loan spreads on average and does not increase default likelihood significantly. Then a caveat to this statement, given the potential importance of underwriters' investor networks, is that borrowers could be choosing an underwriter with an inferior investor network, though enjoying lower financing costs.

To empirically investigate whether this is a non-trivial caveat, we follow Sufi (2007)'s methodology and estimate investors' choice of participating in a given loan as a function of an investor's past interaction with the lead arranger. For any underwriter-participant-time pair, we define a binary variable *D(Investor past relationship with underwriter)* indicating that this investor has in the past participated in a deal underwritten by the same lead arranger. We then estimate regression predicting whether an investor would participate in an upcoming deal:

$$D(Participation)_{i,j,b,t} = f(\beta_1 D(Investor\ past\ relationship\ with\ underwriter)_{i,j,t} + \beta_2 D(Investor\ past\ relationship\ with\ borrower)_{i,b,t} + \gamma Z_{i,t} + \epsilon_{i,j,b,t}) \quad (10)$$

where i denotes investor, j denotes underwriter, b denotes borrower, and t denotes time period. We use a linear probability model to account for high-dimensional fixed effects. In our most stringent

specification, we use deal-level fixed effects and investor-by-time fixed effects. Such a specification absorbs all time-series variations at the borrower level and the investor level.

The results displayed in Table VII show that prior participation in an underwriter's deal does not increase the probability that an investor would participate in the underwriter's future deals. The coefficient on *D(Investor past relationship with underwriter)* is virtually zero and statistically insignificant. In contrast, a past investor-borrower relationship significantly increases the chance of future investor participation. These results are highly consistent with Sufi (2007)'s finding in the traditional syndicated loan market that previous lead arranger-participant relationships are relatively unimportant in explaining participants' decision to lend to a company.

Therefore, more intense pricing competition among potential underwriters is indeed likely to be beneficial for borrowers — as borrowers obtain funds at a more competitive rate, they are not subject to the risk of missing out on access to specialized investors.

V. Additional Analyses

In this section, we conduct further analyses on settings where one might expect underwriter competition to have a stronger or weaker effect on the pricing of institutional loans. To this end, we first examine how the uncertainty about investor demand affects competition among potential underwriters. We then investigate the impact of the relationship between borrowers and their existing underwriters on the pricing process of institutional loans. Finally, we show that the competition among potential underwriters may also affect non-pricing aspects of institutional loans.

A. Uncertainty about investor demand

In our framework, the key force that prevents underwriters from bidding too aggressively in the first stage is the risk of having to flex up when they discover investors' demand in the book-building stage. Hence, expectations about how investors may perceive the deal should factor into

underwriters' strategies. In particular, it is reasonable to expect underwriters to be more cautious when institutional investors' demand is more uncertain. Such an inverse relationship between demand uncertainty and competition intensity can be motivated by either the risk aversion of underwriters or asymmetric payoff between flex-ups and flex-downs.

To empirically examine whether the effect of competition on institutional loan pricing is weakened when investor demand uncertainty is high, we proxy for investor demand using monthly net inflows to CLO and mutual funds, following the methodology of Ivashina and Sun (2011). The investor flow data are provided by S&P LCD at the monthly frequency and capture the fund flow from mutual funds and CLOs to the corporate loan market. To measure the uncertainty about investor demand, we calculate the past 24-month rolling standard deviation of investor flows. Since LCD only starts to provide investor flow data from April 2007, our investor demand uncertainty measure is available only for the period of March 2009 – December 2020.

We split the sample period into two halves based whether the investor demand uncertainty measure is above or below its time-series median. We then regress initial spreads, effect spread flexes, and final spreads of sample deals on the number of unique lead arrangers in a given market segment (over the previous 2 years) or segment-level underwriter HHI for each of the two sample subperiods. If underwriter competition is indeed dampened by uncertainty about institutional investors' demand, we should expect measures of underwriter competition to have a stronger impact on pricing outcomes during the low uncertainty periods.

Table VIII shows the results for the subperiod analyses. In Panel A, we regress the segment-level number of underwriters on initial spreads, spread flexes, and final spreads. During low-uncertainty periods, a higher number of unique underwriters in a given market segment, indicating more intense competition, is associated with a lower initial spread, a higher spread flex, and a lower final spread (Columns 1-3). During periods of high investor demand uncertainty, however, the impact of underwriter numbers on initial spreads, spread adjustments, and final spreads is greatly moderated and is no longer significant (Columns 4-6). This is consistent with our conjecture that investor demand uncertainty attenuates the effect of underwriter competition on institutional loan

pricing.

Panel B of Table VIII repeats the analyses using segment-level underwriter HHI as the proxy for competition. Similar to the results discussed above, we find broadly consistent evidence that underwriter competition has a more pronounced effect on initial spreads, spread flexes, and final spreads during periods when investor demand uncertainty is low. In contrast, the competition effect is dampened or even reversed when underwriters are more uncertain about investors' demand for deals.

B. Borrowers' relationship with underwriters

Past studies have shown that underwriters who served a borrower in its previous deals may form relationships with the firm and provide services outside of security underwriting (Drucker and Puri, 2005; Yasuda, 2005). If this is the case, then we should expect the impact of underwriter competition on loan pricing to be weakened when the relationship between a borrower and its existing underwriter is more robust.

To empirically examine this conjecture, for each deal, we track the lending history of the underwriter and borrower in question. If the lead bank has underwritten another deal for the same borrower in the past, we classify the current deal as having an "underwriter relationship". We then regress initial spreads, effective spread flexes, and final spreads on underwriter competition measures separately on two subsamples depending on whether there is an underwriter relationship. We predict that the pricing effect of underwriter competition should be weaker for the subsample of deals where the winning underwriter has a past relationship with the borrower. The intuition is similar to Liu and Ritter (2011): relationship underwriters provide a differentiated service to the borrower. If a borrower ends up choosing the relationship underwriter to run the deal again, it is likely that the borrower puts less consideration on the dimension of price competition.

Table IX shows the results of this subsample analysis. In Panel A, we regress the segment-level number of underwriters on initial spreads, spread flexes, and final spreads. Columns 1-3 show that the intensity of underwriter competition has a significant impact on the pricing of institutional

loans when the borrower and the underwriter have not worked together on another deal before. Our interpretation is that when no underwriter relationship exists, potential lead banks should compete more aggressively on the pricing of the deal. In contrast, Columns 4-6 of Table IX show that, when the chosen lead bank has an underwriting history with the borrower, competition from other potential underwriters has negligible effects on the pricing of the loan deal.

Panel B of Table IX repeats the same set of analyses using segment-level underwriter HHI as the measure for competition. Consistent with the findings above, the results show that underwriter competition has a more significant effect on institutional loan pricing when there is no pre-existing relationship between the borrower and the underwriter. In contrast, when the borrower and the underwriter have established a relationship, the competition among lead banks is more differentiated, and we find relatively weak competition effects on the pricing term of loan deals.

C. Underwriter competition and covenants

Finally, we recognize the possibility that the competition among potential underwriters may also affect non-pricing aspects of institutional loans. In particular, covenants provide state-contingent transfer of control power that is shown to restrict corporate policies (Chava and Roberts, 2008; Nini, Smith, and Sufi, 2009). From a borrower's perspective, a set of looser covenants could be ex ante appealing conditional on the availability and cost of credit. In the institutional loan market, one prominent example of such features is the covenant-light ("cov-lite") deal term, where the lender forgoes regular enforcement of covenants except if the borrower plans material corporate transactions such as mergers and spin-offs. In other words, a cov-lite contract contains no maintenance provisions such that the borrower would not trigger technical defaults for temporarily failing to maintain certain financial ratios (e.g., leverage ratio). As such, when underwriter competition intensifies, we expect that some lead arrangers may use the "cov-lite" term to attract borrowers on top of price competition.

To empirically examine the competition effect on non-price terms, we regress a dummy variable

of whether a loan is "cov-lite" on our segment-level underwriter competition measure:

$$D(\textit{Cov-lite})_{i,t} = \alpha_t + \beta \textit{Number of underwriters}_{m,t-1} + \gamma Z_{i,t} + \epsilon_{i,t}, \tag{11}$$

where $Z_{i,t}$ is a vector of deal and segment characteristics. Since 2010, the share of cov-lite contracts has risen dramatically in the institutional loan market and reached roughly 80% in 2020 (Bräuning, Ivashina, and Ozdagli, 2021). Our regression focuses on the cross-segment variation in the use of cov-light contracts while taking account of the general trend using time fixed effects.

Table X shows the effect of underwriter competition on the probability of a loan being cov-lite. Columns (1) and (2) show that, when a segment has a larger number of underwriters, deals in that segment are more likely to be cov-lite. Similarly, columns (3) and (4) show that cov-lite deals are more prevalent in segments where underwriter HHI is lower and competition is more intense. In terms of magnitude, a one standard deviation drop in two-year underwriter HHI (0.177) is associated with an increase in the likelihood of cov-lite contracts by 1.7 percentage points (0.177×0.0952). Such an increase is economically small but still meaningful as approximately one-third of the deals in our sample are cov-lite. It may suggest that competition in covenants plays a complementary role to competition in loan pricing.

The results we document above indicate that lead banks compete for deals on both price and non-price terms. This finding also complements the extant studies on the determinant of loan covenants and cov-lite contracts, which mainly focus on creditor coordination costs (Becker and Ivashina, 2016; Berlin, Nini, and Edison, 2020), regulatory disclosure costs (Prilmeier and Stulz, 2019), and credit supply from lenders (Murfin, 2012).

VI. Conclusions

In this paper, we propose that competition among potential underwriters is an important factor in setting the interest spreads in institutional loan market. We build a conceptual framework of underwriter competition in which potential lead banks consider setting a low initial spread by

trading off the benefit winning the underwriting mandate against the potential cost of having to flex up and losing future deals. A more intense competition leads to lower initial spreads and is associated with a probability of flex-ups during the book-building stage.

We find empirical patterns that are consistent with our arguments using data from the institutional loan market. Borrowers are more likely to switch their underwriters if they experienced a flex-up in their previous deal. By measuring ex ante underwriter competition within a rating- and industry-defined market segment, we document a negative relationship between competition intensity and initial (and final) spreads, and a positive relationship between competition intensity and spread adjustments. We further provide evidence for a plausibly exogenous interpretation by using defaults in an underwriter's past deals as negative shocks to an underwriter's ability to compete. Finally, our analyses suggest that the impact of underwriter competition on loan pricing is mitigated by uncertainty about institutional investors' demand and by established business relationships between borrowers and underwriters.

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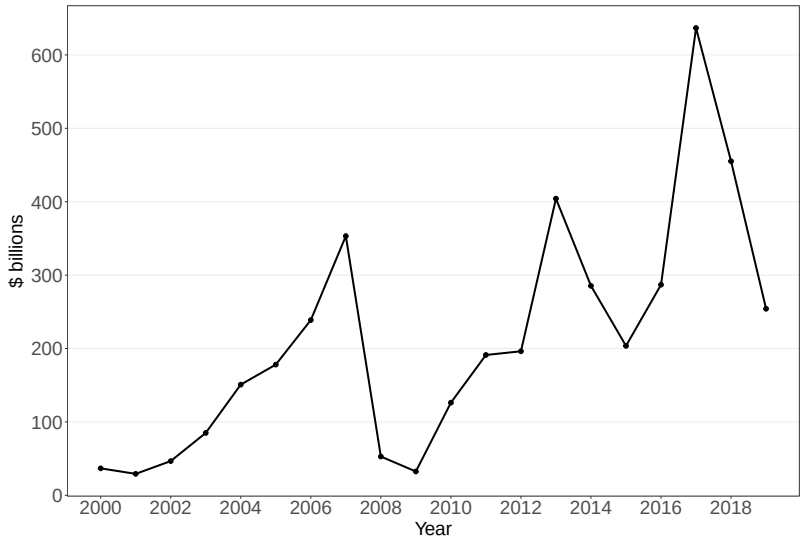
Figure 1: Institutional Loan Market Overview

This figure presents an overview of the institutional loan market. Panel (a) shows the yearly total volume of new issuance from 2000 to 2019. Panel (b) shows the overall distribution of the credit rating of loans in our sample period (2000Q1 to 2020Q3).

(a) Volume of New Issuance



(b) Distribution of Credit Rating at Issuance

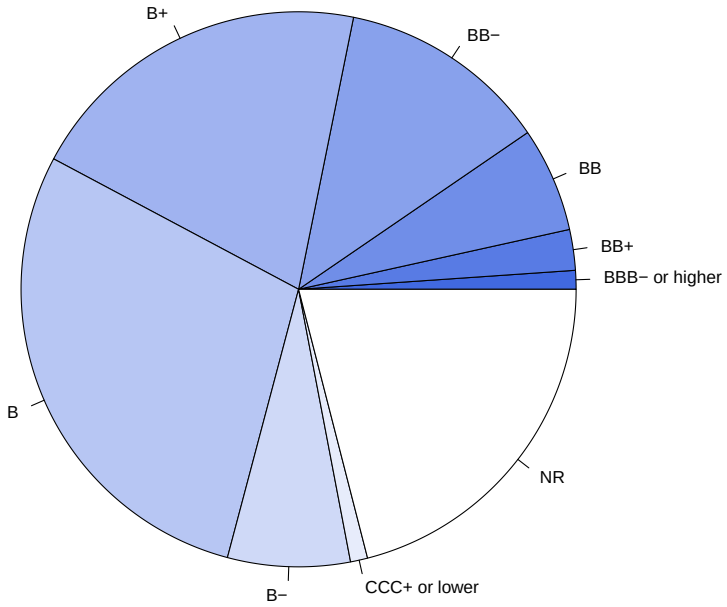
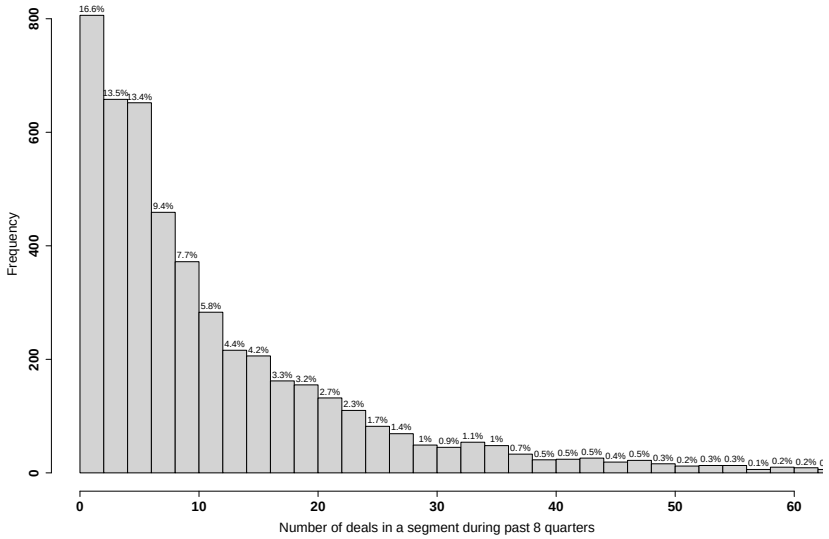


Figure 2: Distribution of Loan Activities at the Segment-Quarter Level

This figure presents the distribution of loan activities (i.e., the number of deals and the number of underwriters) at the segment-quarter level. Segments are defined using the combination of credit ratings and industries. There are five credit-rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. The industry definition follows that of the Fama and French 12 industry portfolios. The combination of these two dimensions thus yields 60 segments for the institutional loan market. For each segment at the end of each quarter, we measure recent loan activities using data from the past 8 quarters, where we calculate the total number of deals and the total number of unique underwriters. Panel (a) and Panel (b) show the distribution of the number of deals and the distribution of the number of unique underwriters, respectively, where the x-axis represents bin values and the y-axis represents the frequency of observations in the sample (the numbers at the top of the bars are those frequency-counts' corresponding proportion of observations).

(a) Segment-quarter level recent number of deals



(b) Segment-quarter level recent number of underwriters

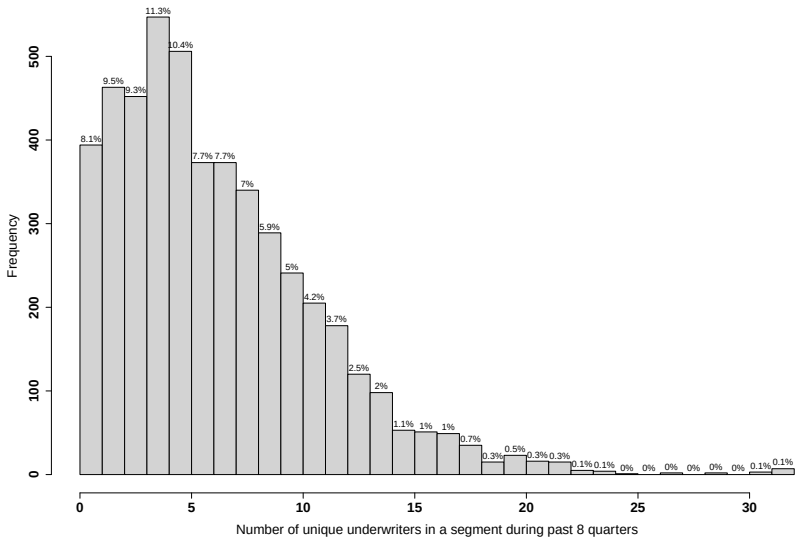
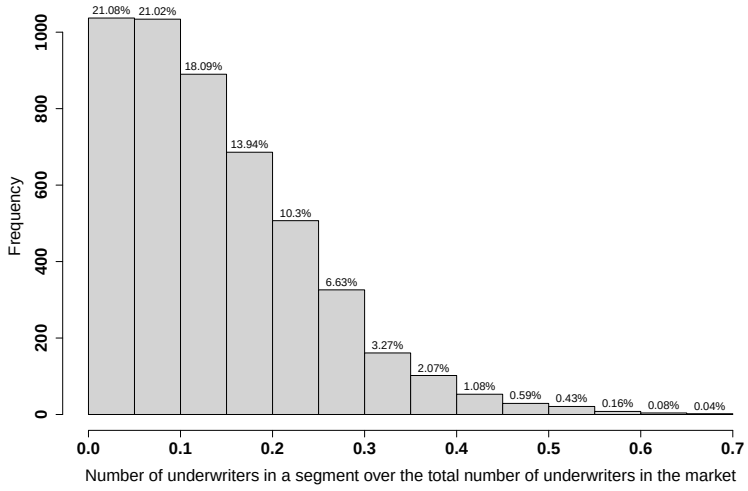


Figure 3: Underwriter Specialization in the Institutional Loan Market

This figure presents simple statistics that indicate the extent to which underwriters specialize and to which underwriters dominate in the institutional loan market. We first define loan segments using the combination of credit ratings and industries. There are five credit-rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. The industry definition follows that of the Fama and French 12 industry portfolios. The combination of these two dimensions thus yields 60 segments for the institutional loan market. We then calculate two statistics. First, for each segment at the end of each quarter, we use data from the past 8 quarters to calculate the total number of unique underwriters both within this segment and across all segments and obtain the ratio of the former over the latter. Second, for each underwriter at the end of each quarter, we use data from the past 8 quarters to obtain its rank in terms of total loan volume underwritten in each segment and count the number of segments in which the underwriter ranks the top. Panel (a) and Panel (b) show the distribution of the first statistic and the distribution of the second statistic, respectively, where the x-axis represents bin values and the y-axis represents the frequency of observations in the sample (the numbers at the top of the bars are those frequency-counts' corresponding proportion of observations).

(a) Proportion of participating underwriters in a segment (segment-quarter level observations)



(b) Number of segments in which an underwriter ranks the top (underwriter-quarter level observations)

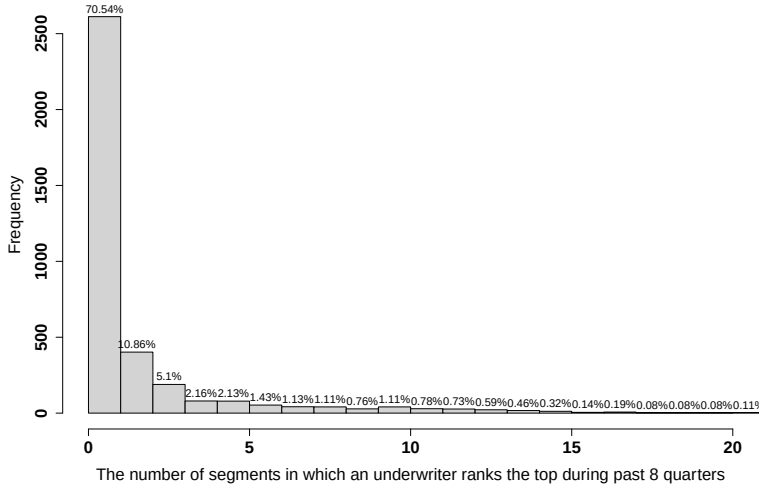


Figure 4: Segment-level underwriter HHI and initial spreads

This figure shows the scatter plot of segment-level underwriter HHIs and the average residualized initial loan spreads. Segment is defined by Fama-French 12 industries and loan credit ratings. The residualized initial spread is estimated from the following regression:

$$Initial\ spread = \beta X + timeFE + \epsilon,$$

where the vector of loan characteristics X includes credit rating, a first time borrower indicator logarithm of loan maturity, logarithm of loan amount, a cov-lite indicator, a sponsored-deal indicator, and a private borrower indicator. The residualized initial spreads are averaged within a market segment.

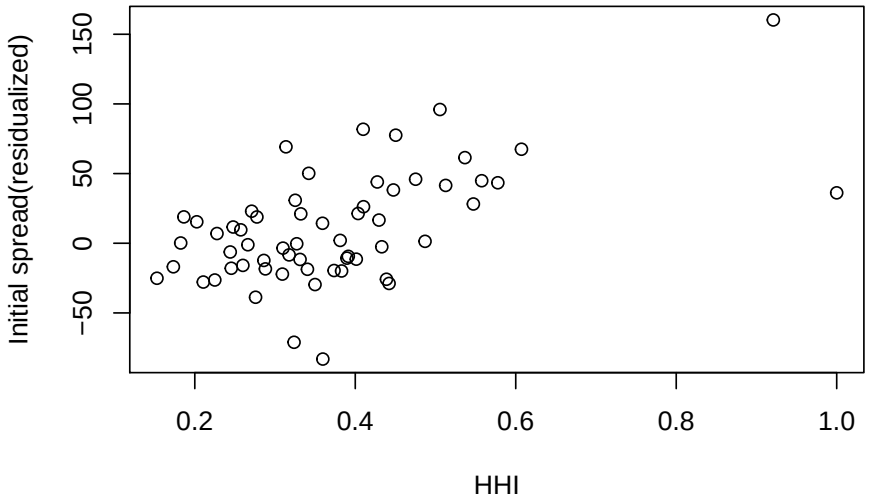


Table I: Summary Statistics

This table shows the summary statistics of the institutional loan sample from 2000 to 2020. Panel A reports deal-level variables; Panel B reports market-segment-level variables. For variables in Panel B, market segments are defined using the combination of five credit-rating categories (i.e., BB or above; B+; B; B- or C; not rated) and twelve industries (i.e., the Fama and French 12 industry portfolios), which yields a total of 60 segments.

	Mean	Std dev	P25	P50	P75	N
Panel A. Deal-level characteristics						
Initial spread (bps)	361.0	138.2	275.0	337.5	425.0	7,505
Deal amount (m USD)	581.7	735.4	175.0	340.0	685.0	7,505
Spread flex (bps)	0.262	30.935	0	0	0	7,505
OID flex (bps)	1.437	19.394	0	0	0	7,505
Effective Spread flex (bps)	0.503	32.431	-1.638	0	0	7,505
Discrete flex (-1,0,1)	-0.135	0.647	-1	0	0	7,505
D(Flex up)	0.151	0.358	0	0	0	7,505
D(First-time borrower)	0.237	0.426	0	0	0	7,505
Maturity (year)	6.058	1.219	5.411	6.101	7.047	7,505
D(Covlite)	0.333	0.471	0	0	1	7,505
D(Sponsored deal)	0.610	0.488	0	1	1	7,505
# Deals with lead arranger	2.451	2.255	1	2	3	7,505
D(Borrower is private firm)	0.698	0.459	0	1	1	7,505
Underwriter market share ^{8Q}	0.119	0.158	0	0.062	0.174	7,505
Underwriter market share ^{20Q}	0.109	0.131	0.008	0.066	0.170	7,505
D(Default in 3 years)	0.021	0.144	0	0	0	7,505
D(Default in 5 years)	0.033	0.179	0	0	0	7,505
Panel B. Segment-level characteristics						
# of unique underwriters ^{8Q}	10.109	6.183	6	9	13	7,505
# of unique underwriters ^{20Q}	14.230	7.618	9	13	18	7,505
Underwriter HHI ^{8Q}	0.262	0.177	0.150	0.203	0.311	7,374
Underwriter HHI ^{20Q}	0.204	0.129	0.132	0.166	0.236	7,413
Segment-level net issuance	17.712	36.636	0.000	6.200	24.630	7,451
Proportion of private borrowers in this segment ^{8Q}	0.700	0.227	0.556	0.760	0.865	7,374
Proportion of private borrowers in this segment ^{20Q}	0.693	0.199	0.571	0.750	0.836	7,413
Underwriter portfolio company defaults in other segments	0.168	3.430	-1.524	-0.390	1.024	7,505

Table II: The effect of underwriter competition on initial spreads

This table examines the relationship between underwriter competition and the initial spreads of loan deals. Observations are at the deal level. *Initial spreads* are the initial spreads of loan deals in basis points. *Log # of underwriters in this segment*^{8Q} measures the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. *D(First-time borrower)* indicates whether a deal is the borrower's first time in the syndicated leveraged loan market. *Log(Deal maturity)* is the logarithm of the deal's maturity. *Log(Deal amount)* measures the logarithm of the deal amount. *D(CovLite*) is an indicator for the deal having the covenant-light feature. *D(Sponsored deal*) indicates whether the deal is sponsored. *Log(#Deals with lead arranger)* measures the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal. *D(Borrower is private firm*) is an indicator for private borrower. *Segment-level net issuance* measures the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter. *Proportion of private borrowers in this segment* ^{8Q} measures the proportion of private borrowers in the focal segment in the past two years. *Underwriter market share*^{8Q} is the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. Fixed effects are indicated in each column. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*Initial spreads*					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(# of underwriters in this segment)^{8Q}	-9.345***	-9.485***	-9.364***			
	(3.318)	(3.119)	(3.341)			
Underwriter HHI in this segment^{8Q}				29.28***	30.55***	30.07***
				(10.782)	(10.039)	(9.457)
D(First-time borrower)	3.930	4.864	4.778	4.058	4.979	4.891
	(3.245)	(3.336)	(3.695)	(3.247)	(3.332)	(3.697)
Log(Deal maturity)	-60.85***	-55.21***	-54.46***	-60.74***	-55.11***	-54.42***
	(9.401)	(9.119)	(10.259)	(9.418)	(9.122)	(10.242)
Log(Deal amount)	-20.63***	-19.60***	-19.03***	-20.61***	-19.57***	-19.03***
	(2.113)	(2.153)	(2.322)	(2.110)	(2.147)	(2.320)
D(Covlite)	-37.56***	-36.44***	-34.48***	-37.69***	-36.50***	-34.47***
	(5.432)	(5.330)	(5.892)	(5.359)	(5.266)	(5.828)
D(Sponsored deal)	9.253***	8.589***	8.082**	9.324***	8.673***	8.158**
	(3.239)	(3.152)	(3.564)	(3.233)	(3.145)	(3.563)
Log(#Deals with lead arranger)	-46.50***	-41.95***	-40.72***	-46.30***	-41.74***	-40.42***
	(3.035)	(3.156)	(2.898)	(3.055)	(3.179)	(2.929)
D(Borrower is private firm)	13.37***	13.10***	12.91***	13.39***	13.11***	12.90***
	(3.271)	(3.204)	(3.229)	(3.263)	(3.200)	(3.216)
Segment-level net issuance	-0.0439	-0.0356	-0.0258	-0.0622*	-0.0534	-0.0432
	(0.035)	(0.033)	(0.036)	(0.034)	(0.034)	(0.036)
Proportion of private borrower in this segment^{8Q}	34.76***	32.68***	37.13***	33.78***	31.79***	36.23***
	(8.715)	(8.635)	(9.717)	(8.626)	(8.485)	(9.576)
Underwriter market share^{8Q}	-17.85**	-17.17*	-25.57**	-17.97**	-17.56*	-26.11***
	(8.171)	(9.796)	(9.823)	(8.213)	(9.868)	(9.790)
Observations	7373	7353	6740	7373	7353	6740
Adjusted R^2	0.527	0.540	0.543	0.527	0.540	0.543
Time FE	Y	Y	NA	Y	Y	NA
Loan purpose FE	Y	Y	Y	Y	Y	Y
Loan rating FE	Y	Y	Y	Y	Y	Y
Lead arranger FE	N	Y	NA	N	Y	NA
Lead arranger-by-time FE	N	N	Y	N	N	Y

Table III: The effect of underwriter competition on spread flexes

This table examines the relationship between underwriter competition and the spread adjustments of loan deals. Observations are at the deal level. *Effective spread flexes* are the effective spread adjustments in basis points defined using Equation (1). *Discrete flex* (-1,0,1) is an outcome variable that takes the value of 1 for a positive spread flex, -1 for a negative spread flex, and 0 for no spread flex. *D(Flex up)* is an indicator for deals with a positive flex. *Initial spreads* are the initial spreads of loan deals in basis points. *Log # of underwriters in this segment*^{8Q} measures the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. *D(First-time borrower)* indicates whether a deal is the borrower's first time in the syndicated leveraged loan market. *Log(Deal maturity)* is the logarithm of the deal's maturity. *Log(Deal amount)* measures the logarithm of the deal amount. *D(CovLite)* is an indicator for the deal having the covenant-light feature. *D(Sponsored deal)* indicates whether the deal is sponsored. *Log(#Deals with lead arranger)* measures the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal. *D(Borrower is private firm)* is an indicator for private borrower. *Segment-level net issuance* measures the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter. *Proportion of private borrowers in this segment* ^{8Q} measures the proportion of private borrowers in the focal segment in the past two years. *Underwriter market share*^{8Q} is the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. Fixed effects are indicated in each column. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*Discrete flex* (-1,0,1)		*D(Flex up)*		*Effective spread flexes*	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(# of underwriters in this segment)^{8Q}	0.0413**		0.0256***		2.956***	
	(0.018)		(0.009)		(1.026)	
Underwriter HHI in this segment^{8Q}		-0.111**		-0.0696***		-8.917***
		(0.049)		(0.023)		(2.990)
Initial spread	0.00215***	0.00215***	0.00129***	0.00129***	0.131***	0.131***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.013)	(0.013)
D(First-time borrower)	-0.00135	-0.00189	0.00566	0.00532	-0.347	-0.384
	(0.024)	(0.024)	(0.013)	(0.013)	(1.210)	(1.212)
Log(Deal maturity)	-0.135**	-0.135**	0.102***	0.102***	-0.733	-0.733
	(0.054)	(0.054)	(0.021)	(0.021)	(2.434)	(2.401)
Log(Deal amount)	0.0288***	0.0288***	0.0446***	0.0446***	1.741***	1.744***
	(0.010)	(0.010)	(0.006)	(0.006)	(0.511)	(0.508)
D(Covlite)	-0.000217	0.000207	0.00977	0.0100	-0.315	-0.302
	(0.024)	(0.024)	(0.013)	(0.013)	(1.415)	(1.400)
D(Sponsored deal)	0.0426*	0.0426*	-0.00389	-0.00387	0.0719	0.0580
	(0.022)	(0.022)	(0.011)	(0.011)	(1.084)	(1.085)
Log(#Deals with lead arranger)	0.0355	0.0345	-0.0218*	-0.0225*	2.969***	2.885**
	(0.023)	(0.023)	(0.012)	(0.012)	(1.115)	(1.115)
D(Borrower is private firm)	-0.0106	-0.0104	-0.0202*	-0.0201*	0.0721	0.0774
	(0.020)	(0.020)	(0.010)	(0.010)	(0.889)	(0.892)
Segment-level net issuance	0.0000284	0.000123	0.00000353	0.0000613	0.0158	0.0218*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.012)	(0.011)
Proportion of private borrower in this segment^{8Q}	-0.0697*	-0.0641	-0.00283	0.000616	-5.621**	-5.294**
	(0.040)	(0.040)	(0.027)	(0.027)	(2.360)	(2.294)
Underwriter market share^{8Q}	0.142**	0.141**	-0.00103	-0.00171	7.304**	7.377**
	(0.060)	(0.062)	(0.031)	(0.031)	(2.920)	(3.003)
Observations	6740	6740	6740	6740	6740	6740
Adjusted R^2	0.165	0.165	0.211	0.211	0.199	0.199
Loan purpose FE	Y	Y	Y	Y	Y	Y
Loan rating FE	Y	Y	Y	Y	Y	Y
Lead arranger-by-time FE	Y	Y	Y	Y	Y	Y

Table IV: The effect of underwriter competition on initial spreads and flexes: exogenous variations

This table presents the relationship between underwriter competition and initial spreads/spread adjustments using deal-level observations, where we add a variable based on the number of recent defaults to capture exogenous variations in underwriters' willingness to compete. The variable, *Underwriter portfolio company defaults in other segments*, is calculated in three steps: we first calculate the number of defaults within the past year from deals underwritten by each underwriter in segments better rated than the focal segment, then aggregate this number using all underwriters that have appeared in the focal market segment within the past two years, and finally demean this sum at the segment level by subtracting the average of the entire sample period. *Initial spreads* are the initial spreads of deals in basis points. *Effective spread flexes* are the effective spread adjustments in basis points defined using Equation (1). *Log # of underwriters in this segment*^{8Q} measures the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. *D(First-time borrower)* indicates whether a deal is the borrower's first time in the syndicated leveraged loan market. *Log(Deal maturity)* is the logarithm of the deal's maturity. *Log(Deal amount)* measures the logarithm of the deal amount. *D(CovLite*) is an indicator for the deal having the covenant-light feature. *D(Sponsored deal*) indicates whether the deal is sponsored. *Log(#Deals with lead arranger)* measures the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal. *D(Borrower is private firm*) is an indicator for private borrower. *Segment-level net issuance* measures the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter. *Proportion of private borrowers in this segment* ^{8Q} measures the proportion of private borrowers in the focal segment in the past two years. *Underwriter market share*^{8Q} is the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. Fixed effects are indicated in each column. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*Initial spreads*		*Effective spread flexes*	
	(1)	(2)	(3)	(4)
Underwriter portfolio company defaults in other segments	2.979***	3.142***	-0.504***	-0.549***
	(0.975)	(0.982)	(0.187)	(0.183)
Log(# of underwriters in this segment)^{8Q}	-9.791***		3.033***	
	(3.303)		(1.015)	
Underwriter HHI in this segment^{8Q}		32.97***		-9.441***
		(9.290)		(2.935)
Initial spread			0.131***	0.131***
			(0.013)	(0.013)
D(First-time borrower)	5.021	5.150	-0.390	-0.432
	(3.669)	(3.667)	(1.211)	(1.212)
Log(Deal maturity)	-54.49***	-54.43***	-0.699	-0.699
	(10.281)	(10.267)	(2.446)	(2.460)
Log(Deal amount)	-19.04***	-19.05***	1.753***	1.759***
	(2.317)	(2.314)	(0.510)	(0.506)
D(Covlite)	-34.71***	-34.68***	-0.258	-0.245
	(5.939)	(5.870)	(1.415)	(1.400)
D(Sponsored deal)	7.952**	8.052**	0.0897	0.0717
	(3.554)	(3.551)	(1.080)	(1.080)
Log(#Deals with lead arranger)	-40.40***	-40.05***	2.936***	2.845**
	(2.882)	(2.907)	(1.110)	(1.108)
D(borrower is private firm)	12.90***	12.90***	0.0682	0.0710
	(3.210)	(3.194)	(0.886)	(0.889)
Segment-level net issuance	-0.0185	-0.0352	0.0146	0.0204*
	(0.038)	(0.037)	(0.012)	(0.011)
Proportion of private borrower in this segment^{8Q}	35.26***	34.33***	-5.323**	-4.983**
	(9.588)	(9.416)	(2.360)	(2.284)
Underwriter market share^{8Q}	-25.81**	-26.63***	7.357**	7.484**
	(9.869)	(9.872)	(2.922)	(3.005)
Observations	6740	6740	6740	6740
Adjusted R^2	0.544	0.545	0.200	0.200
Loan purpose FE	Y	Y	Y	Y
Loan rating FE	Y	Y	Y	Y
Lead arranger-by-time FE	Y	Y	Y	Y

Table V: The effect of spread flexes on future underwriter switch

This table examines borrowers' decision to switch underwriters conditional on spread adjustments. The sample only includes deals where the borrower had a previous institutional loan deal in our full sample. *D(Underwriter Switch*) is an indicator that equals 1 if the underwriter of a borrower's current deal is different from the underwriter of the borrower's previous deal. *Effective spread flex on previous deal* is the spread adjustments in the previous deal of the same borrower. *Discrete flex indicator (-1, 0, 1)* is an indicator that equals 1, 0, and−1 for positive, zero, and negative effective spread flex on the previous deal, respectively. *D(Flex up)* is an indicator that equals 1 for a positive flex on the previous deal. *Final Spread of previous deal* measures the final spread of the borrower's previous deal. *D(First-time borrower on previous deal*) indicates whether a borrower was a first-time leveraged loan borrower in the previous deal. *Log(Maturity) of previous deal* is the logarithm of the deal maturity of the previous deal. *Log(Amount) of previous deal* measures the logarithm of the loan amount of the previous deal. *D(Previous deal is CovLite*) indicates whether the borrower's previous deal is covenant-light. *D(Previous deal is sponsored*) indicates whether the borrower's previous deal is sponsored. *Log(#Deals with lead arranger)* measures the logarithm of the number of deals the borrower has worked with the underwriter of the borrower's previous deal up until the time of the previous deal. *Log(#Years from previous deal)* measures the number of years between the current deal and the borrower's previous deal. *D(Borrower is private firm*) is an indicator for private borrowers. Fixed effects are indicated in each column. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*D(Underwriter switch)*×100					
	(1)	(2)	(3)	(4)	(5)	(6)
Effective spread flex on previous deal	0.0646**	0.0677**				
	(0.028)	(0.028)				
Discrete flex indicator (-1, 0, 1)			3.465***	3.673***		
			(1.127)	(1.106)		
D(Flex up)					3.390*	3.364*
					(1.971)	(1.940)
Final spread of previous deal	0.0165	0.0152	0.0182*	0.0167*	0.0221**	0.0214**
	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)
D(First-time borrower on previous deal)	-3.532*	-2.492	-3.595**	-2.591	-3.620**	-2.521
	(1.789)	(1.880)	(1.781)	(1.876)	(1.789)	(1.882)
Log(Maturity) of previous deal	-16.55***	-16.04***	-16.19***	-15.62***	-16.66***	-16.20***
	(3.839)	(4.540)	(3.784)	(4.478)	(3.957)	(4.634)
Log(Amount) of previous deal	-2.930***	-2.766***	-2.884***	-2.725***	-2.916***	-2.748***
	(0.980)	(0.986)	(0.977)	(0.984)	(0.981)	(0.989)
D(Previous deal is CovLite)	-3.390	-3.056	-3.434	-3.116	-3.413	-3.067
	(2.330)	(2.341)	(2.343)	(2.356)	(2.347)	(2.358)
D(Previous deal is sponsored)	1.148	1.918	1.084	1.840	1.193	2.041
	(1.776)	(2.020)	(1.775)	(2.014)	(1.770)	(2.006)
Log(#Deals with lead arranger)	-7.171***	-7.157***	-7.241***	-7.180***	-6.753***	-6.784***
	(1.458)	(1.506)	(1.464)	(1.516)	(1.471)	(1.528)
Log(#Years from previous deal)	26.34***	26.57***	26.40***	26.63***	26.48***	26.72***
	(2.211)	(2.211)	(2.211)	(2.211)	(2.202)	(2.204)
D(Borrower is private firm)	0.0180	-0.420	0.0382	-0.399	-0.0130	-0.460
	(2.085)	(2.144)	(2.081)	(2.141)	(2.081)	(2.139)
Observations	4189	4189	4189	4189	4189	4189
Adjusted R^2	0.162	0.164	0.163	0.165	0.161	0.164
Time FE	Y	Y	Y	Y	Y	Y
Loan rating FE	Y	Y	Y	Y	Y	Y
Loan purpose FE	N	Y	N	Y	N	Y

Table VI: The effect of underwriter competition on final spreads and future defaults

This table presents the relationship between underwriter competition, final spreads, and future defaults. Observations are at the deal level. *Final spreads* is defined as the initial spread net of any spread adjustment; it is in basis points as an outcome variable in Columns 1-2 and in percentage as a regressor in Columns 3-6. *D(Default in 3 years)* indicates whether the loan goes into default within 3 years after deal closure. *D(Default in 5 years)* indicates whether the loan goes into default within 5 years after deal closure. *Log # of underwriters in this segment*^{8Q} measures the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. *D(First-time borrower)* indicates whether a deal is the borrower's first time in the syndicated leveraged loan market. *Log(Deal maturity)* is the logarithm of the deal's maturity. *Log(Deal amount)* measures the logarithm of the deal amount. *D(CovLite)* is an indicator for the deal having the covenant-light feature. *D(Sponsored deal)* indicates whether the deal is sponsored. *Log(#Deals with lead arranger)* measures the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal. *D(Borrower is private firm)* is an indicator for private borrower. *Segment-level net issuance* measures the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter. *Proportion of private borrowers in this segment* ^{8Q} measures the proportion of private borrowers in the focal segment in the past two years. *Underwriter market share*^{8Q} is the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. Fixed effects are indicated in each column. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*Final spreads*		*D(Default in 3 years)*		*D(Default in 5 years)*	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(# of underwriters in this segment)^{8Q}	-7.740**		-0.000870		-0.00593	
	(3.748)		(0.004)		(0.006)	
Underwriter HHI in this segment^{8Q}		25.34**		0.00401		0.00728
		(10.589)		(0.012)		(0.019)
Final spread (%)			0.0122***	0.0122***	0.0155***	0.0156***
			(0.003)	(0.003)	(0.003)	(0.003)
D(First-time borrower)	4.874	4.966	0.00864	0.00865	0.0139*	0.0140*
	(4.193)	(4.193)	(0.006)	(0.006)	(0.008)	(0.008)
Log(Deal maturity)	-61.42***	-61.38***	0.0118	0.0118	0.0171	0.0168
	(10.591)	(10.567)	(0.009)	(0.009)	(0.012)	(0.012)
Log(Deal amount)	-19.73***	-19.74***	0.00734***	0.00733***	0.0124***	0.0125***
	(2.624)	(2.622)	(0.002)	(0.002)	(0.003)	(0.003)
D(Covlite)	-39.00***	-38.98***	0.000417	0.000440	0.0143*	0.0140*
	(6.673)	(6.616)	(0.005)	(0.005)	(0.007)	(0.007)
D(Sponsored deal)	9.325**	9.397**	-0.0131***	-0.0131***	-0.0158***	-0.0159***
	(3.991)	(3.986)	(0.004)	(0.004)	(0.005)	(0.005)
Log(#Deals with lead arranger)	-42.61***	-42.35***	-0.00317	-0.00313	-0.00752	-0.00748
	(3.365)	(3.385)	(0.004)	(0.004)	(0.007)	(0.007)
D(Borrower is private firm)	14.64***	14.64***	-0.00187	-0.00185	-0.00626	-0.00636
	(3.561)	(3.547)	(0.005)	(0.005)	(0.007)	(0.007)
Segment-level net issuance	-0.0141	-0.0282	0.0000168	0.0000160	0.0000622	0.0000310
	(0.044)	(0.044)	(0.000)	(0.000)	(0.000)	(0.000)
Proportion of private borrower in this segment^{8Q}	36.15***	35.45***	0.0299**	0.0299***	0.0515***	0.0506***
	(10.989)	(10.813)	(0.011)	(0.011)	(0.015)	(0.015)
Underwriter market share^{8Q}	-21.22*	-21.75*	-0.000317	-0.000504	-0.0148	-0.0135
	(11.464)	(11.478)	(0.008)	(0.008)	(0.014)	(0.014)
Observations	6740	6740	6568	6568	5343	5343
Adjusted R^2	0.488	0.488	0.042	0.042	0.036	0.036
Loan purpose FE	Y	Y	Y	Y	Y	Y
Loan rating FE	Y	Y	Y	Y	Y	Y
Lead arranger-by-time FE	Y	Y	Y	Y	Y	Y

Table VII: Investors' participation choices and prior relationships with underwriters

This table presents how investors' prior relationship with the underwriter affects the probability of participating in a loan deal. The potential-participant set is defined as all investors that have participated in any deal(s) in the leveraged loan market in the past 8 quarters. The observations are at the deal issuance and potential investors pair level. *D(Investor past relationship with underwriter)* indicates whether the investor has a prior relationship with the underwriter. *D(Investor past relationship with borrower)* indicates whether the investor has a prior relationship with the borrower. *Initial spreads (%)* is the initial spread of the deal in percentage. *Log(Deal maturity)* is the logarithm of the deal maturity. *Log(Deal amount)* measures the logarithm of the deal's dollar amount. *D(CovLite)* is an indicator for the covenant-light feature. *D(Sponsored deal)* indicates whether the deal is sponsored. *D(Borrower is private firm)* is an indicator for private borrowers. Fixed effects are indicated in each column. Standard errors are two-way clustered at the investor and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*D(Participation)*	
	(1)	(2)
D(Investor past relationship with underwriter)	0.000219	0.000272
	(0.001)	(0.001)
D(Investor past relationship with borrower)	0.171***	0.174***
	(0.013)	(0.013)
Initial spread (%)	-0.00251***	
	(0.000)	
Log(Deal maturity)	0.00456*	
	(0.003)	
Log(Deal amount)	0.00202**	
	(0.001)	
D(Covlite)	0.000584	
	(0.001)	
D(Sponsored deal)	-0.000744	
	(0.001)	
D(Borrower is private firm)	0.00106	
	(0.001)	
Observations	1178813	1178813
Adjusted R^2	0.175	0.188
Loan purpose FE	Y	N
Loan rating FE	Y	N
Lead arranger-by-time FE	Y	N
Investor-by-time FE	Y	Y
Deal FE	N	Y

Table VIII: Investor demand uncertainty and the effect of underwriter competition

This table presents how uncertainty about investor demand affects the relationship between underwriter competition and institutional loan pricing. Investor demand uncertainty is measured by the rolling-24-month standard deviation of monthly flows from mutual funds and CLOs in the leveraged loan market. In both panels, the sample is split into two subsamples based on whether the uncertainty measure of a period is above or below the time-series median. In Panel A, underwriter competition is measured by *Log # of underwriters in this segment*^{8Q}, the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years; in Panel B, underwriter competition is measured by *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. In both panels, the outcome variables are: *Initial spreads*, the initial spread of the deal in basis points; *Spread flexes*, the effective spread adjustments in basis points defined using Equation (1), and *Final spreads*, defined as the initial spread net of any spread adjustment. In both panels, control variables include: *D(First-time borrower)*, whether a deal is the borrower's first time in the syndicated leveraged loan market; *Log(Deal maturity)*, the logarithm of the deal's maturity; *Log(Deal amount)*, the logarithm of the deal amount; *D(Sponsored deal)*, whether the deal is sponsored; *Log(#Deals with lead arranger)*, the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal; *D(Borrower is private firm)*, an indicator for private borrowers; *Segment-level net issuance*, the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter; *Proportion of private borrowers in this segment* ^{8Q}, the proportion of private borrowers in the focal segment in the past two years; and *Underwriter market share*^{8Q}, the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. All columns in both panels include time, loan-purpose, loan-rating, and lead-arranger fixed effects. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Competition measured by the number of underwriters

Sample period	Low uncertainty			High uncertainty		
Dependent variable	*Initial spreads*	*Spread flexes*	*Final spreads*	*Initial spreads*	*Spread flexes*	*Final spreads*
	(1)	(2)	(3)	(4)	(5)	(6)
Log(# of underwriters in this segment)^{8Q}	-16.55*	6.319***	-13.03	-7.364	2.603	-5.909
	(8.058)	(2.047)	(9.384)	(5.304)	(2.278)	(6.158)
Observations	2146	2146	2146	2261	2261	2261
Adjusted R^2	0.474	0.225	0.410	0.501	0.204	0.449

Panel B: Competition measured by underwriter HHI

Sample period	Low uncertainty			High uncertainty		
Dependent variable	*Initial spreads*	*Spread flexes*	*Final spreads*	*Initial spreads*	*Spread flexes*	*Final spreads*
	(1)	(2)	(3)	(4)	(5)	(6)
Underwriter HHI in this segment^{8Q}	36.49	-15.56**	27.03	27.05	-8.774	22.27
	(25.588)	(5.631)	(27.935)	(16.687)	(7.033)	(19.534)
Observations	2146	2146	2146	2261	2261	2261
Adjusted R^2	0.474	0.225	0.410	0.501	0.205	0.449

Table IX: Borrowers' prior relationship with underwriters and the effect of underwriter competition

This table presents how borrowers' prior relationship with the underwriter affects the relationship between underwriter competition and institutional loan pricing. In both panels, the sample is split into two subsamples based on whether the underwriter of a deal has underwritten another deal with the same borrower in the past. In Panel A, underwriter competition is measured by *Log # of underwriters in this segment*^{8Q}, the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years; in Panel B, underwriter competition is measured by *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. In both panels, the outcome variables are: *Initial spreads*, the initial spread of the deal in basis points; *Spread flexes*, the effective spread adjustments in basis points defined using Equation (1), and *Final spreads*, defined as the initial spread net of any spread adjustment. In both panels, control variables include: *D(First-time borrower)*, whether a deal is the borrower's first time in the syndicated leveraged loan market; *Log(Deal maturity)*, the logarithm of the deal's maturity; *Log(Deal amount)*, the logarithm of the deal amount; *D(Sponsored deal*), whether the deal is sponsored; *Log(#Deals with lead arranger)*, the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal; *D(Borrower is private firm*), an indicator for private borrowers; *Segment-level net issuance*, the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter; *Proportion of private borrowers in this segment* ^{8Q}, the proportion of private borrowers in the focal segment in the past two years; and *Underwriter market share*^{8Q}, the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. All columns in both panels include time, loan-purpose, loan-rating, and lead-arranger fixed effects. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Competition measured by the number of underwriters

Borrower and underwriter	No prior relationship			Have prior deal(s)		
Dependent variable	*Initial spreads*	*Spread flexes*	*Final spreads*	*Initial spreads*	*Spread flexes*	*Final spreads*
	(1)	(2)	(3)	(4)	(5)	(6)
Log(# of underwriters in this segment)^{8Q}	-10.83***	3.511***	-9.196**	-7.496	1.898	-6.216
	(3.720)	(1.245)	(4.471)	(4.613)	(1.165)	(4.856)
Observations	3497	3497	3497	3839	3839	3839
Adjusted R^2	0.528	0.223	0.467	0.539	0.140	0.496

Panel B: Competition measured by underwriter HHI

Borrower and underwriter	No prior relationship			Have prior deal(s)		
Dependent variable	*Initial spreads*	*Spread flexes*	*Final spreads*	*Initial spreads*	*Spread flexes*	*Final spreads*
	(1)	(2)	(3)	(4)	(5)	(6)
Underwriter HHI in this segment^{8Q}	33.13***	-9.863***	28.85**	29.17**	-9.266**	22.55
	(11.532)	(3.261)	(13.151)	(13.740)	(4.019)	(14.582)
Observations	3497	3497	3497	3839	3839	3839
Adjusted R^2	0.528	0.223	0.467	0.540	0.141	0.496

Table X: The effect of underwriter competition on non-pricing items: Cov-Lite

This table presents the relationship between underwriter competition and the covenant-light ("Cov-Lite") feature of loan deals. Observations are at the deal level.*D(CovLite)* is an indicator for the deal having the covenant-light feature. *Log # of underwriters in this segment*^{8Q} measures the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. *Underwriter HHI in this segment* ^{8Q} is the HHI index calculated from underwriter market shares in the same market segment in the past two years, where market shares are based on the dollar amount of loans underwritten. *Final spreads* is defined as the initial spread net of any spread adjustment, in percentage. *D(First-time borrower)* indicates whether a deal is the borrower's first time in the syndicated leveraged loan market. *Log(Deal maturity)* is the logarithm of the deal's maturity. *Log(Deal amount)* measures the logarithm of the deal amount. *D(Sponsored deal*) indicates whether the deal is sponsored. *Log(#Deals with lead arranger)* measures the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal. *D(Borrower is private firm*) is an indicator for private borrower. *Segment-level net issuance* measures the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter. *Proportion of private borrowers in this segment* ^{8Q} measures the proportion of private borrowers in the focal segment in the past two years. *Underwriter market share*^{8Q} is the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. Fixed effects are indicated in each column. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*D(CovLite)*	
	(1)	(2)
Log(# of underwriters in this segment)^{8Q}	0.0358***	
	(0.010)	
Underwriter HHI in this segment^{8Q}		-0.0932***
		(0.029)
Final spread (%)	-0.0412***	-0.0413***
	(0.009)	(0.009)
D(First-time borrower)	-0.0511***	-0.0516***
	(0.012)	(0.012)
Log(Deal maturity)	0.110***	0.110***
	(0.036)	(0.036)
Log(Deal amount)	0.0570***	0.0570***
	(0.008)	(0.008)
D(Sponsored deal)	0.0972***	0.0974***
	(0.020)	(0.020)
Log(#Deals with lead arranger)	-0.0376**	-0.0385**
	(0.019)	(0.018)
D(Borrower is private firm)	-0.00893	-0.00875
	(0.015)	(0.015)
Segment-level net issuance	0.000117	0.000201
	(0.000)	(0.000)
Proportion of private borrower in this segment^{8Q}	-0.00267	0.00251
	(0.031)	(0.030)
Underwriter market share^{8Q}	-0.0124	-0.0141
	(0.033)	(0.033)
Observations	6740	6740
Adjusted R^2	0.488	0.488
Loan purpose FE	Y	Y
Loan rating FE	Y	Y
Lead arranger-by-time FE	Y	Y

Appendix

Definition of Variables

Variable	Definition
Initial spread	Facility-amount-weighted initial spread across all institutional facilities within the deal.
Deal amount	Total amount on all institutional facilities within the deal.
Spread flex	Facility-amount-weighted spread flex across all institutional facilities within the deal. For institutional facilities with a missing value of spread flex, we replace it with zero by assuming that not reporting flexes implies zero spread adjustments.
OID flex	Facility-amount-weighted OID (Original Issue Discount) flex across all institutional facilities within the deal. For institutional facilities with a missing value of OID flex, we replace it with zero by assuming that not reporting flexes implies zero spread adjustments.
Effective spread flex	$Spread\ Flex + \frac{OID\ Flex}{Maturity\ (in\ years)}$.
Discrete flex (-1,0,1)	A discrete variable that takes the value of 1 for positive effective spread flex, -1 for negative flex, and 0 for no flex.
D(Flex up)	An indicator for deals with positive effective spread flex.
D(First-time borrower)	An indicator for first-time institutional loan borrowers.
Deal Maturity	Facility-amount-weighted maturity across all institutional facilities within the deal.
D(Covlite)	An indicator for a loan deal having the covenant-light feature.
D(Sponsored deal)	An indicator for sponsored deals.
#Deals with lead arranger	Number of institutional loan deals for which the borrower has worked with the underwriter.

D(Borrower is private firm)	An indicator for private borrowers.
Underwriter market share ^{8Q}	An underwriter's market share in the focal segment in the past eight quarters, defined using the total dollar amount of loans underwritten.
Underwriter market share ^{20Q}	An underwriter's market share in the focal segment in the past 20 quarters, defined using the total dollar amount of loans underwritten.
D(Default in 3 years)	An indicator for loan default within three years after issuance.
D(Default in 5 years)	An indicator for loan default within five years after issuance.
D(Underwriter switch)	An indicator that equals 1 if the underwriter of a borrower's current deal is different from the underwriter of the same borrower's previous deal. For deals with multiple underwriters, the indicator is equal to one if none of the current underwriters underwrote the borrower's previous deal).
# of years from previous deal	The number of years between the current deal and the same borrower's previous deal.
# of unique underwriter in this segment ^{8Q}	The number of unique underwriters that have appeared in deals in the focal market segment within the most recent eight quarters.
# of unique underwriter in this segment ^{20Q}	The number of unique underwriters that have appeared in deals in the focal market segment within the past 20 quarters.
Underwriter HHI in this segment ^{8Q}	The HHI calculated from underwriter market shares within the focal market segment in the most recent eight quarters, where market shares are defined using the total dollar amount of loans underwritten.
Underwriter HHI in this segment ^{20Q}	The HHI calculated from underwriter market shares within the focal market segment in the most recent 20 quarters, where market shares are defined using the total dollar amount of loans underwritten.

Segment-level net issuance	Segment-level net loan issuance amount (total new loan issuance minus total loan retirement) from $QuarterEnd_{t-2}$ to $QuarterEnd_{t-1}$.
Proportion of private borrowers in this segment ^{8Q}	The number of unique private borrowers divided by the number of unique borrowers in the focal market segment, based on data from the most recent eight quarters.
Proportion of private borrowers in this segment ^{20Q}	The number of unique private borrowers divided by the number of unique borrowers in the focal market segment, based on data from the most recent 20 quarters.
Underwriter portfolio company defaults in other segments	This variable is calculated in three steps: first, calculate the number of defaults within the most recent year from deals underwritten by each underwriter in segments better rated than the focal segment; second, aggregate this number using all underwriters that have appeared in the focal segment within the most recent eight quarters; and finally, demean this sum at the segment level by subtracting the average of the entire sample period.
Investor demand uncertainty	The rolling previous-24-month standard deviation of investor flows from CLO and mutual funds to the institutional loan market.
D(Investor past relationship with underwriter)	An indicator that equals 1 if an investor has a prior relationship with the underwriter in the institutional loan market.
D(Investor past relationship with borrower)	An indicator that equals 1 if an investor has a prior relationship with the borrower in the institutional loan market.

Internet Appendix

A. A Simple Model of Underwriter Competition

Given the institutional loan syndication process in practice, we model underwriter competition using a setting akin to a first-price sealed-bid auction with finite number of bidders, where the highest bidder in terms of loan price (i.e., lowest bidder in terms of loan spread) wins. Each bidder is faced with the same trade-off: bidding a lower spread increases the probability of winning the deal and thus earning underwriting fees but implies higher expected costs associated with the situation of an upward spread flex. Our main purpose is to derive explicitly how the number of bidders, our proxy for competition intensity, affects the equilibrium bidding strategy given this trade-off.

Consider a borrower in need of a risky loan, for which there are N ex ante identical risk-neutral loan underwriters competing with each other ($N \geq 2$). Each underwriter submits a sealed bid, in the form of loan spreads, and the borrower chooses the one with the best price (i.e., lowest spread). The winning underwriter earns underwriting fees and her bid then corresponds to the initial spread. After underwritten, the loan is sold to investors participating in the pipeline.

A.1. Information and Payoff Structure

At the beginning of the process, each underwriter independently and privately draws a signal of investors' demand for the loan, in the form of loan spread, from an identical, continuous uniform distribution characterized by PDF $f(s)$ and CDF $F(s)$, with a finite support $[\underline{s}, \bar{s}]$. Denote underwriter i's signal as s_i. A lower signal magnitude (i.e., lower spread) indicates stronger demand since we are implicitly fixing the loan amount. Underwriters then bid according to the signal they draw — denote the bid of underwriter i as b_i. The winning underwriter, denoted by subscript w, derives utility $u > 0$ from underwriting fees and her bid b_w becomes the initial spread on the loan pipeline. We impose the following assumptions.

Assumption 1: *When making the bid, each underwriter expects the final loan spread (denoted as r^F) at which the loan is sold to pipeline participants is a linear combination of her own signal and*

the unconditional mean of the signal distribution, i.e.,

$$E[r^F|s_w] = \alpha \cdot s_w + (1-\alpha) \cdot \frac{\bar{s}+\underline{s}}{2} \ , \quad 0 < \alpha < 1 \ , \tag{IA1}$$

where α is an exogenous parameter that represents the precision of underwriters' signals.

Assumption 2: *The winning underwriter's utility has two components: one is the utility from underwriting fees and the other proportional to adjustments in loan spread from her initial bid to the final spread,*

$$U(b_w) = u - \phi \cdot (r^F - b_w) \ , \ \phi > 0 \ . \tag{IA2}$$

The second component says that upward (downward) adjustments of the loan spread are viewed negatively (positively) by the borrower, presumably due to the borrower forming a preference that disproportionately decreases (increases) the probability of the current underwriter winning future deals. This is also consistent with the fact that, in practice, an upward spread flex due to under-subscription of investors typically implies a reduction in fees earned by the underwriter. If an underwriter does not win the deal, her payoff in utility terms is assumed to be zero.

A.2. Objective and Equilibrium Strategy

For each underwriter i, the objective is to maximize expected utility by making a bid after observing the signal s_i:

$$\max_{b_i} \ \text{Prob}(i \text{ wins}) \cdot E[U(b_i)|s_i] \ . \tag{IA3}$$

We characterize the equilibrium strategy following the intuition of the Revelation Principle in the sense that we first restrict underwriters' input to the bidding function to their actual signals and then characterize the optimal bidding strategy (the function $b(\cdot)$) using the conditions for nonexistence of profitable deviation, where deviation is defined as giving an input different from the actual signal. Given the signal structure and the assumption on the bidding strategy, the probability of underwriter i winning the bid is equivalent to that of her input to the common bidding function being the lowest. Hence, conditional on other bidders all using their actual

signals, the probability of bidder i winning with an input s is:

$$[1 - F(s)]^{N-1} \ .$$

Hence, the expected utility of underwriter i if she uses an input s to the bidding function is

$$[1 - F(s)]^{N-1} \cdot E[U(b(s))|s_i] \tag{IA4}$$

Define $G(s)$ as

$$G(s) = [1 - F(s)]^{N-1} \cdot E[U(b(s))|s_i] \ . \tag{IA5}$$

Then for there to be no profitable deviation from using the actual signal s_i as input, we need the following first-order condition:

$$G'(s_i) = 0 \ , \tag{IA6}$$

which is equivalent to

$$[1 - F(s_i)]^{N-1} \cdot \frac{\partial E[U(b(s_i))|s_i]}{\partial s_i} = (N-1) \cdot [1 - F(s_i)]^{N-2} \cdot f(s_i) \cdot E[U(b(s_i))|s_i] \ . \tag{IA7}$$

Note that we also need the individual rationality condition in the sense that the expected utility upon winning should be larger than zero, i.e.,

$$E[U(b(s_i))|s_i] > 0 \ . \tag{IA8}$$

Denote $b_i^* = b(s_i)$. Rearrange equation (IA7), we obtain

$$\frac{\partial \log E[U(b_i^*)|s_i]}{\partial s_i} = (N-1) \cdot \frac{f(s_i)}{1 - F(s_i)} \ , \tag{IA9}$$

which is equivalent to

$$- \frac{\partial \log E[U(b_i^*)|s_i]}{\partial s_i} = \frac{\partial \log(\text{Prob}(i \text{ wins}))}{\partial s_i} \ . \tag{IA10}$$

For an infinitesimal decrease in the input of the bidding function from the actual signal s_i (i.e., a slightly more aggressive bid), the left-hand-side represents the marginal percentage decrease in the expected utility upon winning (i.e., expected marginal cost due to the borrower penalizing upward spread adjustments) while the right-hand-side represents the marginal percentage increase in the probability of winning (i.e., expected marginal benefit). Hence, the intuition of the first-order condition is straightforward: for any given underwriter, the equilibrium bidding function is such that, in expectation, the marginal benefit equals the marginal cost of a slight deviation from using her actual signal as the input.

Conditional on signal s_i, the expected utility of bidder i upon winning by using input s is:

$$u - \phi \cdot \left[\alpha s_i + (1-\alpha) \cdot \frac{\bar{s}+\underline{s}}{2} - b(s)\right] \tag{IA11}$$

Hence, the first-order condition as in equation (IA9) can be written as

$$\frac{\phi \cdot \frac{\partial b_i^*}{\partial s_i}}{u - \phi \cdot \left[\alpha s_i + (1-\alpha) \cdot \frac{\bar{s}+\underline{s}}{2} - b_i^*\right]} = (N-1) \cdot \frac{f(s_i)}{1-F(s_i)} \ , \tag{IA12}$$

which is simplified to

$$b_i^* = -\frac{u}{\phi} + \frac{\bar{s}-s_i}{N-1} \cdot \frac{\partial b_i^*}{\partial s_i} + \alpha s_i + (1-\alpha) \cdot \frac{\bar{s}+\underline{s}}{2} \ . \tag{IA13}$$

Solve this differential equation, we obtain

$$\begin{aligned} b_i^* &= -\frac{u}{\phi} + \frac{N-1}{N} \cdot \alpha \cdot s_i + \frac{\alpha}{N} \cdot \bar{s} + (1-\alpha) \cdot \frac{\bar{s}+\underline{s}}{2} \\ &= \frac{\alpha}{N} \cdot (\bar{s} - s_i) - \frac{u}{\phi} + \alpha \cdot s_i + (1-\alpha) \cdot \frac{\bar{s}+\underline{s}}{2} \ , \end{aligned} \tag{IA14}$$

where the first term captures the competitive effect that is key to our framework: the more intense the competition among underwriters, the more aggressive underwriters bid in equilibrium. To see the intuition, first note that the right-hand-side of equation IA9 means for larger N, an underwriter gains higher percentage increase in her winning probability if she deviates by using an alternative

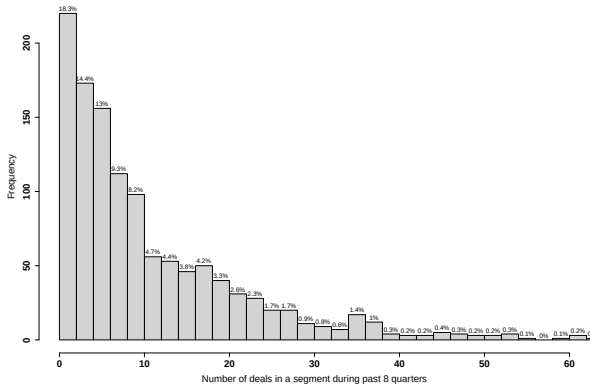
input to the equilibrium bidding function that is infinitesimally below her actual signal. Then, according to the same equation, such deviation must result in a higher percentage decrease in the underwriter's expected utility upon winning, which means the level of this utility is lower in equilibrium for larger N. Given how utility is specified as in Assumption 2, it must be the case that the underwriter bids more aggressively in equilibrium when N is larger.

B. Additional Figures and Tables

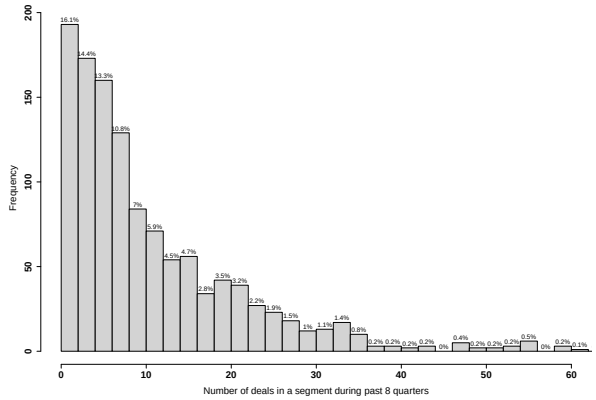
Figure IA1: Distribution of Loan Activities in Different Time Periods — Segment-quarter Number of Deals

This figure presents the distribution of the number of deals at the segment-quarter level in various time periods. Segments are defined using the combination of credit ratings and industries. There are five credit-rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. The industry definition follows that of the Fama and French 12 industry portfolios. The combination of these two dimensions thus yields 60 segments for the institutional loan market. For each segment at the end of each quarter, we use data from the past 8 quarters to calculate the total number of deals. Panels (a) through (d) show the distribution of the number of deals for different time periods, where the x-axis represents bin values and the y-axis represents the frequency of observations in the sample (the numbers at the top of the bars are those frequency-counts' corresponding proportion of observations).

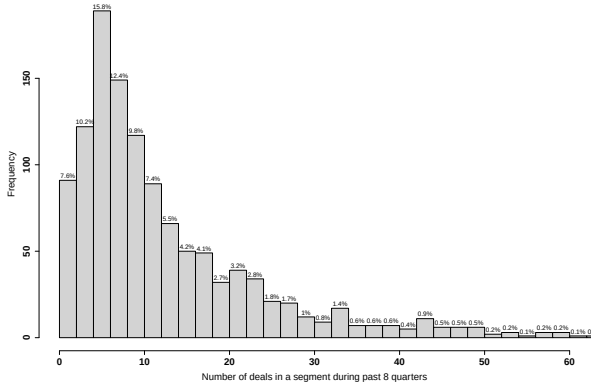
(a) 2002-2006



(b) 2007-2011



(c) 2012-2016



(d) 2017-2020

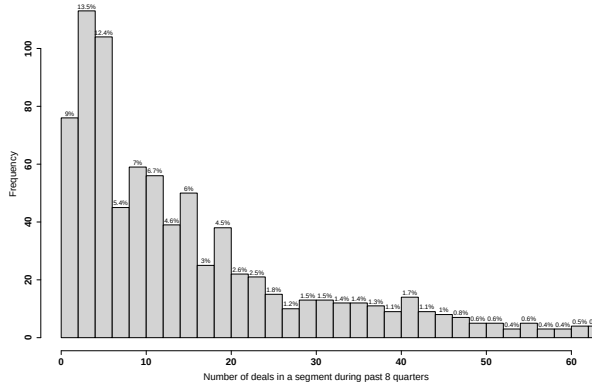
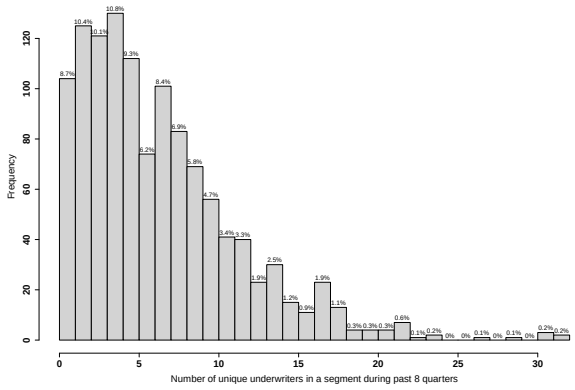


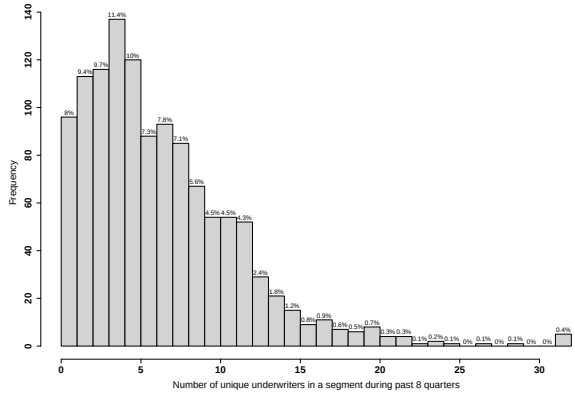
Figure IA2: Distribution of Loan Activities in Different Time Periods — Segment-quarter Number of Underwriters

This figure presents the distribution of the number of underwriters at the segment-quarter level in various time periods. Segments are defined using the combination of credit ratings and industries. There are five credit-rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. The industry definition follows that of the Fama and French 12 industry portfolios. The combination of these two dimensions thus yields 60 segments for the institutional loan market. For each segment at the end of each quarter, we use data from the past 8 quarters to calculate the total number of unique underwriters. Panels (a) through (d) show the distribution of the number of unique underwriters for different time periods, where the x-axis represents bin values and the y-axis represents the frequency of observations in the sample (the numbers at the top of the bars are those frequency-counts' corresponding proportion of observations).

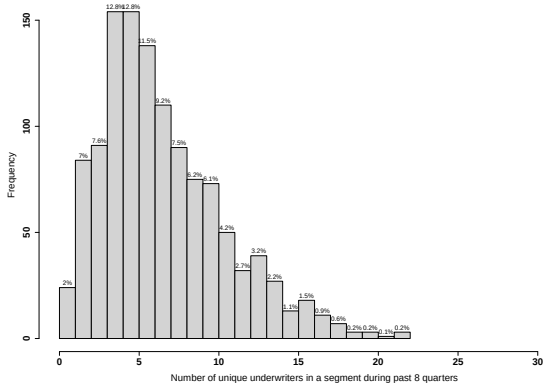
(a) 2002-2006



(b) 2007-2011



(c) 2012-2016



(d) 2017-2020

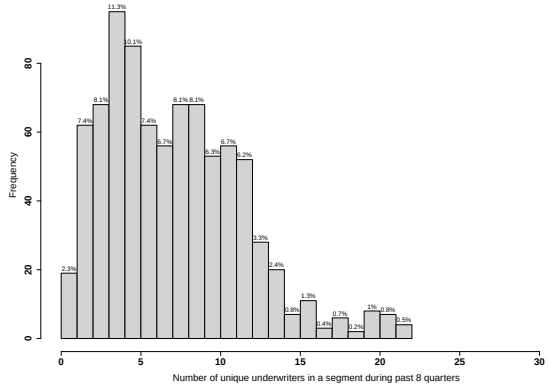
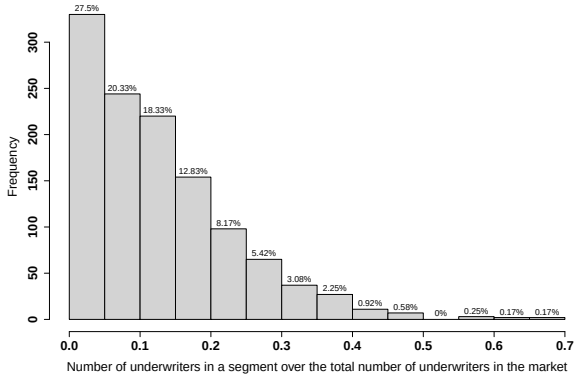


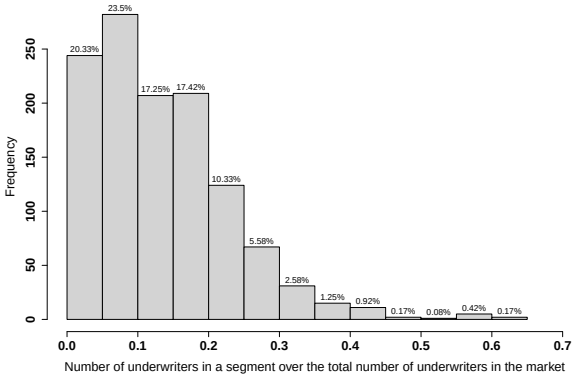
Figure IA3: Underwriter Specialization in Different Time Periods — Underwriter Proportions (Segment-quarter Observations)

This figure presents a simple statistic that indicates the extent to which underwriters specialize in the institutional loan market in different periods. We first define loan segments using the combination of credit ratings and industries. There are five credit-rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. The industry definition follows that of the Fama and French 12 industry portfolios. The combination of these two dimensions thus yields 60 segments for the institutional loan market. Then, for each segment at the end of each quarter, we use data from the past 8 quarters to calculate the total number of unique underwriters both within this segment and across all segments and obtain the ratio of the former over the latter. Panels (a) through (d) show the distribution of this statistic in different time periods, where the x-axis represents bin values and the y-axis represents the frequency of observations in the sample (the numbers at the top of the bars are those frequency-counts' corresponding proportion of observations).

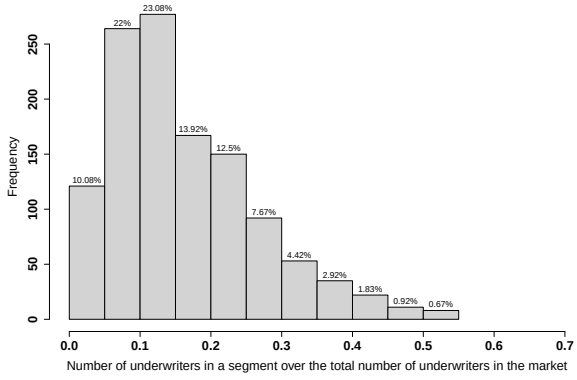
(a) 2002-2006



(b) 2007-2011



(c) 2012-2016



(d) 2017-2020

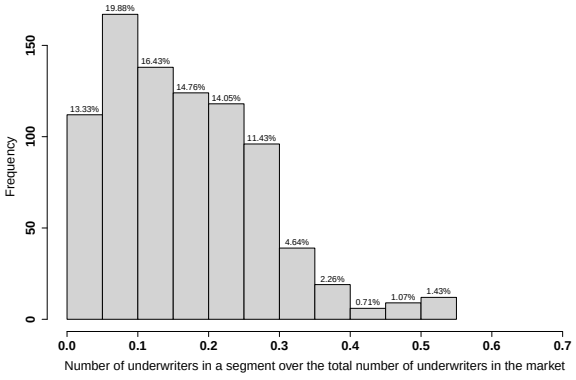
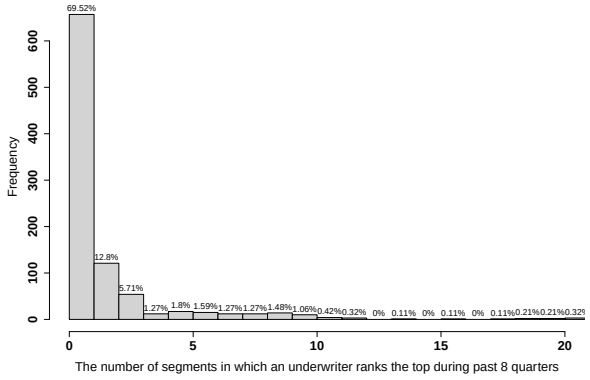


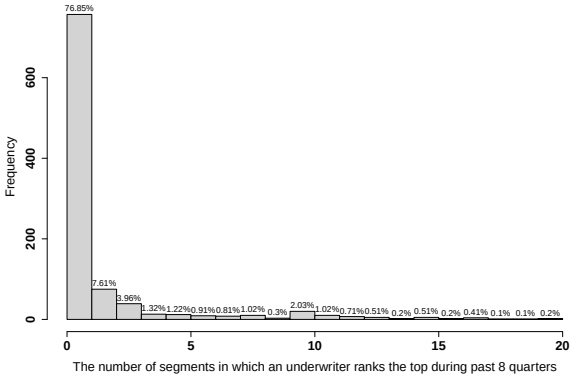
Figure IA4: Underwriter Specialization in Different Time Periods — Common Presence of Dominant Underwriters (Underwriter-quarter Observations)

This figure presents another simple statistic that indicates the extent to which underwriters specialize in the institutional loan market in different periods. We first define loan segments using the combination of credit ratings and industries. There are five credit-rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. The industry definition follows that of the Fama and French 12 industry portfolios. The combination of these two dimensions thus yields 60 segments for the institutional loan market. Then, for each underwriter at the end of each quarter, we use data from the past 8 quarters to obtain its rank in terms of total loan volume underwritten in each segment and count the number of segments in which the underwriter ranks the top. Panels (a) through (d) show the distribution of this statistic in different time periods, where the x-axis represents bin values and the y-axis represents the frequency of observations in the sample (the numbers at the top of the bars are those frequency-counts' corresponding proportion of observations).

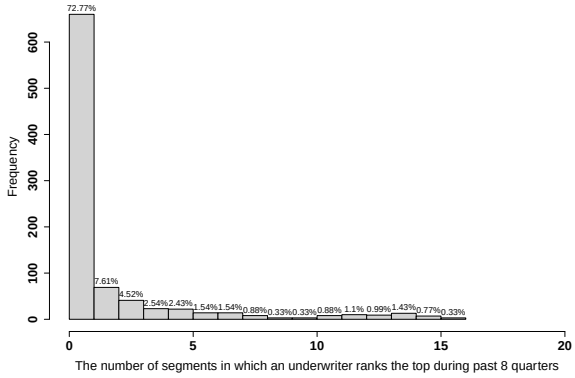
(a) 2002-2006



(b) 2007-2011



(c) 2012-2016



(d) 2017-2020

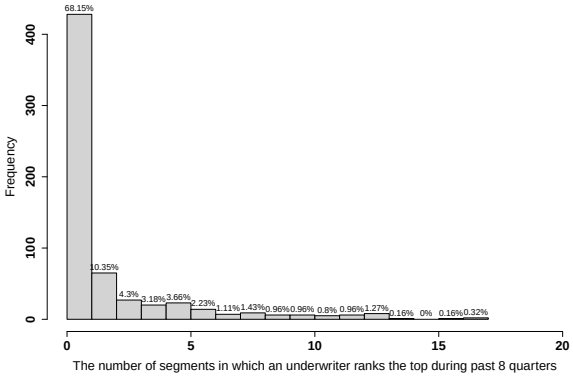


Table IA1: Additional summary of the number of deals

This table presents an additional summary of the number of deals along three dimensions. Panel A shows the number of deals by the five credit rating categories: (1) BB or above; (2) B+; (3) B; (4) B- or C; and (5) not rated. Panel B shows the number of deals by the twelve industries, which are defined using the Fama and French 12 industry portfolios. Panel C shows the top market segments in terms of the number of deals.

Panel A: Number of deals by credit rating category

Credit Rating	# of Deals
BB or above	1,638
B+	1,530
B	2,151
B- or C	610
Not Rated	1,576

Panel B: Number of deals by industry

Industry	# of Deals
Non-Durables: Food, Tobacco, Textiles, Apparel, Leather, Toys	447
Durables: Cars, TV's, Furniture, Household Appliances	262
Manufacturing: Machinery, Trucks, Planes, Off Furn, Paper	838
Energy: Oil, Gas, and Coal Extraction and Products	165
Chemicals and Allied Products	286
Business Equipment: Computers, Software, and Electronic Equipment	762
Telephone and Television Transmission	591
Utilities	257
Wholesale, Retail, and Some Services (Laundries, Repair Shops)	979
Healthcare, Medical Equipment, and Drugs	622
Money and Finance	526
Other: Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment	1,770

Panel C: Top segments by the number of deals

Segment Rank	Credit Rating	Industry	# of Deals
1	B	Other: Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment	555
2	Not Rated	Other: Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment	388
3	BB or above	Other: Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment	355
4	B+	Other: Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment	343
5	B	Wholesale, Retail, and Some Services (Laundries, Repair Shops)	343
6	B	Business Equipment: Computers, Software, and Electronic Equipment	253
7	B	Manufacturing: Machinery, Trucks, Planes, Off Furn, Paper	219
8	B	Healthcare, Medical Equipment, and Drugs	207
9	BB or above	Manufacturing: Machinery, Trucks, Planes, Off Furn, Paper	204
10	B+	Manufacturing: Machinery, Trucks, Planes, Off Furn, Paper	195

Table IA2: The effect of underwriter competition on loan pricing: alternative competition measure

This table presents the relationship between underwriter competition and loan pricing, where we measure competition based on the most recent 20 quarters instead of 8 quarters, i.e., underwriter competition is now measured by *Log # of underwriters in this segment*^{20Q}, the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past five years. The outcome variables are: *Initial spreads*, the initial spread of the deal in basis points; *Discrete flex* (-1,0,1), a discrete variable that takes the value of 1 for a positive spread flex, -1 for a negative spread flex, and 0 for no spread flex; *D(Flex up)*, an indicator for deals with a positive flex; *Effective spread flexes*, the effective spread adjustments in basis points defined using Equation (1), and *Final spreads*, defined as the initial spread net of any spread adjustment. Control variables include: *D(First-time borrower)*, whether a deal is the borrower's first time in the syndicated leveraged loan market; *Log(Deal maturity)*, the logarithm of the deal's maturity; *Log(Deal amount)*, the logarithm of the deal amount; *D(Sponsored deal*), whether the deal is sponsored; *Log(#Deals with lead arranger)*, the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal; *D(Borrower is private firm*), an indicator for private borrowers; *Segment-level net issuance*, the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter; *Proportion of private borrowers in this segment* ^{20Q}, the proportion of private borrowers in the focal segment in the past five years; and *Underwriter market share*^{20Q}, the underwriter's market share in the focal segment in the past five years based on the dollar amount of loans underwritten. All columns include loan-purpose, loan-rating, and lead-arranger-by-time fixed effects. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*Initial spread*	*Discrete flex* (-1,0,1)	*D(Flex up)*	*Effective spread flexes*	*Final spread*
	(1)	(2)	(3)	(4)	(5)
Log(# of underwriters in this segment)^{20Q}	-13.09***	0.0314	0.0226**	2.578**	-12.41***
	(4.039)	(0.021)	(0.011)	(1.145)	(4.584)
Initial spread		0.00215***	0.00129***	0.131***	
		(0.000)	(0.000)	(0.013)	
D(First-time borrower)	4.594	-0.00446	0.00446	-0.532	4.476
	(3.618)	(0.024)	(0.013)	(1.184)	(4.131)
Log(Deal maturity)	-54.79***	-0.126**	0.105***	-0.316	-61.44***
	(10.153)	(0.054)	(0.021)	(2.401)	(10.545)
Log(Deal amount)	-18.76***	0.0291***	0.0441***	1.750***	-19.44***
	(2.312)	(0.010)	(0.006)	(0.500)	(2.605)
D(Covlite)	-34.60***	-0.00175	0.00908	-0.329	-39.18***
	(5.866)	(0.024)	(0.013)	(1.402)	(6.646)
D(Sponsored deal)	7.876**	0.0419*	-0.00288	-0.0219	9.003**
	(3.585)	(0.022)	(0.011)	(1.068)	(3.999)
Log(#Deals with lead arranger)	-40.76***	0.0396*	-0.0218*	3.200***	-42.47***
	(2.882)	(0.023)	(0.012)	(1.115)	(3.325)
D(Borrower is private firm)	13.09***	-0.0139	-0.0206**	0.00464	14.77***
	(3.257)	(0.020)	(0.010)	(0.905)	(3.597)
Segment-level net issuance	-0.0395	0.0000826	0.0000313	0.0184	-0.0269
	(0.036)	(0.000)	(0.000)	(0.012)	(0.044)
Proportion of private borrower in this segment^{20Q}	51.24***	-0.0300	0.0138	-2.708	54.96***
	(11.679)	(0.059)	(0.037)	(2.601)	(13.347)
Underwriter market share^{20Q}	-34.07***	0.100	0.00459	8.295**	-29.58**
	(12.459)	(0.082)	(0.047)	(3.661)	(13.764)
Observations	6778	6778	6778	6778	6778
Adjusted R^2	0.546	0.164	0.211	0.204	0.492

Table IA3: The effect of underwriter competition on loan pricing: additional controls

This table presents the relationship between underwriter competition and loan pricing, where we impose additional control variables using public borrowers' accounting information reported in Compustat as of the most recent fiscal year-end before the loan deal: *Log(Total assets)*, the logarithm of the borrower's total assets; *ROA*, return on asset; and *Leverage*, the sum of long-term debts and debt in current liabilities divided by total assets. For these variables, we impose zeros for private borrowers. Observations are at the deal level. Underwriter competition is measured by *Log # of underwriters in this segment*^{8Q}, the logarithm of the number of unique underwriters that have appeared in deals in the same market segment within the past two years. The outcome variables are: *Initial spreads*, the initial spread of the deal in basis points; *Discrete flex* (-1,0,1), a discrete variable that takes the value of 1 for a positive spread flex, -1 for a negative spread flex, and 0 for no spread flex; *D(Flex up)*, an indicator for deals with a positive flex; *Effective spread flexes*, the effective spread adjustments in basis points defined using Equation (1), and *Final spreads*, defined as the initial spread net of any spread adjustment. Other control variables include: *D(First-time borrower)*, whether a deal is the borrower's first time in the syndicated leveraged loan market; *Log(Deal maturity)*, the logarithm of the deal's maturity; *Log(Deal amount)*, the logarithm of the deal amount; *D(Sponsored deal)*, whether the deal is sponsored; *Log(#Deals with lead arranger)*, the logarithm of the number of times the borrower has worked with the underwriter up until the time of the underlying deal; *D(Borrower is private firm)*, an indicator for private borrowers; *Segment-level net issuance*, the segment-level net issuance amount (new loan issuances minus loan retirements) in the previous quarter; *Proportion of private borrowers in this segment* ^{8Q}, the proportion of private borrowers in the focal segment in the past two years; and *Underwriter market share*^{8Q}, the underwriter's market share in the focal segment in the past two years based on the dollar amount of loans underwritten. All columns include loan-purpose, loan-rating, and lead-arranger-by-time fixed effects. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively. Standard errors are two-way clustered at the borrower and the quarter level, shown in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	*Initial spread*	*Discrete flex* (-1,0,1)	*D(Flex up)*	*Effective spread flexes*	*Final spread*
	(1)	(2)	(3)	(4)	(5)
Log(# of underwriters in this segment)^{8Q}	-9.465***	0.0405**	0.0251***	2.956***	-7.852**
	(3.331)	(0.018)	(0.009)	(1.026)	(3.734)
Initial spread		0.00215***	0.00129***	0.131***	
		(0.000)	(0.000)	(0.013)	
D(First-time borrower)	5.497	-0.000870	0.00593	-0.401	5.632
	(3.739)	(0.024)	(0.013)	(1.218)	(4.256)
Log(Deal maturity)	-53.86***	-0.137**	0.101***	-0.803	-60.82***
	(10.132)	(0.055)	(0.021)	(2.464)	(10.452)
Log(Deal amount)	-18.09***	0.0302***	0.0453***	1.687***	-18.73***
	(2.336)	(0.010)	(0.006)	(0.507)	(2.626)
D(Covlite)	-34.91***	-0.0000188	0.00986	-0.269	-39.45***
	(5.909)	(0.024)	(0.013)	(1.418)	(6.679)
D(Sponsored deal)	8.257**	0.0427*	-0.00384	0.0512	9.502**
	(3.552)	(0.022)	(0.011)	(1.072)	(3.981)
Log(#Deals with lead arranger)	-39.18***	0.0362	-0.0215*	2.863**	-40.99***
	(2.897)	(0.023)	(0.012)	(1.115)	(3.353)
Log(Total Assets)	-3.335**	-0.00932	-0.00521	0.154	-3.564*
	(1.673)	(0.009)	(0.005)	(0.461)	(1.867)
ROA	-50.77	0.0697	0.0424	5.868	-51.77
	(42.059)	(0.131)	(0.064)	(5.948)	(45.761)
Leverage	-27.86***	0.0475	0.0263	2.915	-28.96***
	(8.582)	(0.068)	(0.034)	(3.279)	(10.805)
D(Borrower is private firm)	-26.64*	-0.0609	-0.0483	2.693	-27.22*
	(13.884)	(0.086)	(0.044)	(3.832)	(15.201)
Segment-level net issuance	-0.0279	0.0000309	0.00000494	0.0160	-0.0163
	(0.036)	(0.000)	(0.000)	(0.012)	(0.044)
Proportion of private borrower in this segment^{8Q}	36.31***	-0.0693*	-0.00259	-5.558**	35.30***
	(9.790)	(0.040)	(0.027)	(2.362)	(11.062)
Underwriter market share^{8Q}	-25.15**	0.141**	-0.00150	7.256**	-20.80*
	(9.882)	(0.061)	(0.031)	(2.937)	(11.518)
Observations	6740	6740	6740	6740	6740
Adjusted R^2	0.544	0.164	0.211	0.199	0.489