Bookrunner syndicate geography and the quality of service: The benefits of a local team

Abstract

We analyze how the geography of bookrunner syndicates affects the quality of service provided to bond issuing firms, as reflected in the pricing of euro-denominated corporate bond tranches. We find that syndicates with a higher share of domestic bookrunners obtain lower at-issue credit spreads for issuing firms. Domestic bookrunners can have locational advantage which not only gives them better access to the investors base, it also gives them "soft" informational advantage as they are more familiar with the bond issuer. We find that the tranches issued during the financial crisis and the eurozone crisis periods drive our findings, and both certification and placement roles become important to bond issuers in these crisis periods characterised by high information asymmetry. Our results are robust to other definitions of bookrunner geography.

JEL Classification: G11; G12; G24

Keywords: Bookrunner geography; at-issue credit spread; quality of service; financial crisis; eurozone crisis; placement function; geographical proximity

1. Introduction

Compiling an effective bookrunner syndicate has become increasingly challenging for bond issuers. Following the 2008 financial crisis, more banks have established debt intermediation services (Kaya and Meyer, 2013; Stothard, 2013) and the average bookrunner group size has increased (Carbo-Valverde et al., 2017; Chivukula et al., 2014). Therefore, corporate treasurers have more banks to choose from and more possible bookrunner syndicate structures to consider. It is generally recognized that the optimal bookrunner configuration is important to the success of corporate bond issues. Research shows that appointing intermediaries that are suitable for the issuing firm and security type affects a range of bond issuance parameters, including pricing, fees charged, default rates, and financial misrepresentation (Andres et al., 2014; Butler, 2008; Fang, 2005; Shivdasani and Song, 2011). As corporates continue to move towards a more capital markets-focused funding model, including greater use of the corporate bond market, the bookrunner structure decision becomes increasingly important and a more frequent consideration (Eurofi, 2014).

In this paper, we focus specifically on one important aspect of the bookrunner syndicate, the geographic split of the bookrunners, as this characteristic has been linked to the quality of bond bookrunner services (Arena and Dewally, 2012; Butler, 2008; Lau and Yu, 2010). Specifically, we investigate the impact of the proportion of the non-domestic bookrunners in the syndicate on the quality of services, proxied by the at-issue credit spread. To our knowledge, this is the first paper to consider the effect of the overall structure of the full bond bookrunner syndicate, not simply a sole or lead underwriter (Butler, 2008; Lau and Yu, 2010).[1]

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[1] The cross-country differences in our sample allow us to extend the concept of locality examined in Butler (2008) and Arena and Dewally (2012) across national borders where informational, legal, cultural and linguistic barriers could affect the choice between using domestic and non-domestic bookrunners. Moreover, bookrunner syndicates in the euro-denominated market are larger and the choice to use domestic or non-domestic bookrunners is non-binary. We also extend the definition of a domestic bookrunner beyond headquarter location by focusing on the lending commitments of bookrunners in the domestic economy and directly to the issuing firm.

This allows us to more accurately study the nature of the international debt capital markets, where multiple bookrunners co-operate closely in a relatively egalitarian structure throughout the bond issuance process. We also incorporate all key decision parameters an issuer applies when selecting bookrunners, including their league table position, geography, prior lending relationship, and distribution network. In addition, we take into account the increasingly common method of appointing both active and passive bookrunners in the overall bookrunner structure.

Debt intermediation theories posit two main functions for a bond bookrunner syndicate. They have a certification role, evaluating the issuer on behalf of investors (Chemmanur and Fulghieri, 1994), and a placement role, which involves marketing and distributing the securities to be issued (Kessel, 1971). Although there is evidence pointing out the benefits of the certification role of bookrunners in syndicated market (Fang, 2005), others suggest that bookrunners have been shifting their focus from certifying quality to maximizing issuers' valuation (Andres et al., 2014). On the placement function, the literature provides a consistent view on the benefits of bookrunner locality. Domestic bookrunners potentially have more experience of the local investor base during their location advantage derived from their geographical proximity to issuers, allowing them to better assess the expected demand for the issued securities (Butler, 2008).

We examine the arguments based on these theories using a sample of 2,409 investment-grade euro-denominated corporate bond tranches issued between 2001 and 2020. The sample period and the security market examined provide a distinct setting to evaluate the role of bookrunners and the quality of their service. This period also allows us to consider the impact of the global financial crisis and the eurozone crisis on the relation between bookrunner syndicate geography and quality of service and the importance of the placement and certification roles. We have the benefit of examining a reasonably homogeneous product

market, unlike other international studies (Lau and Yu, 2010), and we have a wider range of issuer and bookrunner heterogeneity than US-focused studies (Arena and Dewally, 2010; Butler, 2008). The euro-denominated corporate bond market has both a shared currency and common legislation set out in the European Union Prospectus Directive governing bond market issuance. Euro-denominated corporate bonds are also priced against a common benchmark mid-swap rate. There is consistency in prospectus drafting, which is typically undertaken in accordance with templates produced by the International Capital Market Association (ICMA, 2014). In addition, our sample of bonds is relatively free of the sort of covenants found in high yield securities. Therefore, we can largely ignore foreign exchange and legal factors and focus on the importance of cross-country differences to explain the impact of bookrunners on the pricing of corporate bond tranches.

We find that the appointment of a higher share of domestic bookrunners leads to a reduction in the at-issue spread suggesting an improvement in the quality of service. We propose that domestic bookrunners have locational advantage which not only gives them better access to the investors base, it also gives them "soft" informational advantage as they are more familiar with the issuer and its operations. Our results are robust to other definitions of bookrunner geography and when we control for endogeneity in the assignment of bookrunner roles.

Importantly, we find that our main results are driven by tranches issued during both the global financial crisis and the eurozone crisis. Before the global financial crisis and after the eurozone crisis, we find no relation between bookrunner syndicate geographic make-up and quality of service. These results suggest that the relative importance of the intermediary services in the bond market varies with financial market conditions. Heterogeneity in at-issue spreads increased in the years during the crisis periods, and this has strengthened the importance of bookrunner certification to investors. Post-crisis, borrowers have responded to

the restricted availability of bank credit by diversifying financing sources and accessing the bond market more regularly (Adrian et al., 2012). Our results suggest that investors place greater importance on the improved quality of certification and placement services carried out by domestic bookrunners during this period of higher information asymmetry.

We find also that the relation between bookrunner geography and at-issue credit spread is not linked to any of the conventional drivers of pricing power in the corporate bond markets. For example, it does not reflect better certification capabilities, as the results are not affected by taking into account existing lending relationships or by excluding passive bookrunners.[2] Also, it is not the result of major European banks enjoying market power in the placement of bonds and use this for issuance from their home market (Chemmanur and Krishnan, 2012). Additionally, it cannot be attributed to larger investor networks (Massa and Zaldokas, 2014), as we show that the non-domestic bookrunner skewed syndicates is unrelated to the investors' demand for the bond.[3] Finally our results also hold when taking into account the bookrunner league table position.

The remainder of the paper is organised as follows. In section 2, we set out the theoretical framework for bookrunner appointments and their roles. Section 3 describes the sample selection process, and section 4 discusses the empirical findings and robustness tests. Section 5 concludes.

2. Bookrunner syndicate determinants

2.1. Bookrunner syndicate formation and their roles

One of the first tasks of a prospective corporate bond issuer is to appoint a bookrunner syndicate. This decision process is driven by a range of factors, including existing banking and lending relationships, bookrunner reputation, market conditions, target investor base, the

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[2] As we will discuss later in the paper, the only role for passive bookrunners is the certification of the debt issuance.
[3] Note that, unlike various prior studies focusing on smaller US debt issuance (Butler, 2008), international investor demand is critical for European corporate bond issuance.

riskiness of the securities, and spread of investment banking ancillary business (Carbó-Valverde et al., 2017; Corwin and Schultz, 2005; Lau and Yu, 2010; Wyman, 2016; Yasuda, 2005).

A bookrunner syndicate has two main roles. Firstly, it is expected to certify the issuer and the transaction documentation on behalf of investors, ensuring there are no imminent materially adverse risks facing the issuer and that the prospectus does not contain misleading information (Chemmanur and Fulghieri, 1994). The empirical literature finds mixed evidence on the importance of the role of certification in syndicated loan market. For example Dick-Nielse et al. (2021), Fang (2005), and Puri (1999) argue that the certification function has a key role as it reduces the information asymmetry between the issuers and the investors, ultimately benefitting the issuer. However, other studies question the certification hypothesis and argue that (reputable) underwriters are more focused on maximizing issuers' valuation through increased yield (Andres et al., 2014).

Secondly, the syndicate has a placement role, which involves marketing and distributing the securities to be issued (Kessel, 1971; Lau and Yu, 2010). This responsibility includes optimally positioning the bond tranche and the issuer so as to obtain large and price-competitive orders. As such this commercial role has both a *quantitative* aspect, being the size of investor distribution network and a *qualitative* dimension, namely the effectiveness of the marketing outreach and communication. As orders are typically amassed in a joint orderbook, it is not transparent to the issuer which bank has outperformed in this regard.

Unlike a municipal bond issuer (Butler, 2008), a corporate bond issuer typically appoints three or more bookrunners so as to seek to benefit from a range of capabilities and views and to distribute its coveted ancillary business (Arena and Dewally, 2010; Lau and Yu, 2010). Since the 2008 financial crisis, it has become more common to appoint a larger bookrunner group and relegating a subset of these bookrunners to passive bookrunner status,

where they are only engaged in the certification role.[4] This is done to reduce communication inefficiencies and free-rider incentives of large syndicates. Amongst the active bookrunners, those responsible for both certification and placements, issuers typically divide sub-roles to ensure a reasonably harmonious and collaborative syndicate. For instance, one bank may take the lead on the marketing materials while the other oversees the prospectus drafting. The concept of the lead underwriter (as discussed in Lau and Yu, 2010) is relatively rare in the European corporate bond markets, as only 0.7% of tranches have this type of hierarchy (source: Dealogic).[5] It is highly unusual for an issuer to work with the same bookrunner syndicate computation over subsequent bond issuances. Most regular issuers in the corporate bond market are under significant pressure from their lending banks to spread out their debt capital markets ancillary business, resulting in the frequent rotation of roles (Wyman, 2016).

2.2. Bookrunner syndicate geography and the quality of their service

The literature provides arguments that the geographic make-up of a bookrunner syndicate will have a bearing on the quality of bookrunner services (Butler, 2008; Lau and Yu, 2010). This proposed relation could be driven by the certification and/or placement role of the bookrunner syndicate.

Theories based on certification function provide mixed results on its importance. Corwin and Schultz (2005) suggest that domestic bookrunners have closer relationships with issuing firms and industries, which generates valuable soft information and allows them to better certify firm quality. Non-domestic bookrunners are less likely to acquire this valuable soft information, which could place them at a disadvantage in monitoring issuing firm quality (Arena and Dewally, 2012). However, Andres et al. (2014) argues that underwriters may not

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[4] See for instance the article "Banks chase top spot in league" (eFinancial News [Online], 11 May 2009).
[5] Dealogic search of European corporate bond tranches with a "global co-ordinator", being the equivalent term for a "lead underwriter". In our sample, around 4.6% of the tranches have "global co-ordinator".

fulfil certification role focusing more on maximizing the issuers' valuation through increased yield.

We argue that the relation between bookrunner syndicate geography and the quality of their service is not driven by the certification role of the bookrunners, at least in normal non-recessionary periods, as the certification role is fulfilled by both domestic and non-domestic bookrunners (as well as by active and passive bookrunners). Ineffectiveness in this role can carry major downside risks in the form of investor litigation if any material misstatements or adverse information about the issuer are discovered post bond issuance. Therefore, the joint bookrunner syndicate relies on the diligence undertaken by a bookrunner legal counsel, a role typically fulfilled by a major international law firm.

On the other hand, we expect to see a domestic bookrunner effect in the quality of service due to their placement role in the bond issue. The empirical literature shows that domestic bookrunners, due to their proximity to the issuer, are likely have more soft information about the issuer and its operations (Butler, 2008; Corwin and Schultz, 2005; Lau and Yu, 2010; Petersen and Rajan, 2002). As a result, they are more likely to attract "motivated buyers" with price-competitive orders (Butler, 2008; Lau and Yu, 2010). Butler (2008) finds that hiring a local investment bank, identified as those with an office in the issuing state, allows borrowers in the municipal bond market to issue at a lower cost. Unrated and high credit risk bonds, where the benefits from the greater knowledge of the local investor base are expected to be greatest, drive the pricing improvement. Lau and Yu (2010) find that geographically proximate bookrunners are more likely to market unrated and risky bonds and are able to achieve lower issue costs for these securities.[6]

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[6] These studies only consider the characteristics of a single bookrunner, reflecting either the nature of the bond market they study (Butler, 2008) or data availability (Lau and Yu, 2010). However, most public bond offerings, are led by a group of bookrunners. In addition, these studies incorporate high yield offerings, which likely accentuate the impact of bookrunner selection.

Our study, therefore, intends to closely approximate all the decision parameters of regular corporate bond issuers. Unlike Butler (2008) and Lau and Yu (2010), we focus on the characteristics of the entire bookrunner group and study exclusively investment-grade rated tranches. This should also be a stronger test of theories of financial intermediation. Differences between at-issue credit spreads of investment-grade corporate bond tranches should be small and fully explainable by tranche characteristics. Moreover, the international scope of these firms' operations should diminish the importance of local bookrunner relationships in explaining bond pricing. Likewise, by focusing on the euro-denominated market, we examine a more geographically heterogeneous market than the US and hence a less concentrated market for bookrunners.

Considering the indifference in the certification role between domestic and non-domestic bookrunners, and the importance of the placement role fulfilled by domestic bookrunners due to their location advantage, we expect the geographic distribution of bookrunner syndicate to have an impact on the quality of services provided. However, this relation may be changed during crisis periods as we discuss it in the next section.

2.3. Impact of crises (global financial and the eurozone)

We expect that the relation between bookrunner geography and quality of service to be stronger during the crisis years due to a risk aversion effect. We consider both the global financial crisis and the eurozone crisis (see section 4.3 for details). Empirical research has shown that crisis or distress years are characterized by greater investor risk-aversion (Guiso et al., 2018) and our own data highlights an increase in at-issue credit spreads during this period (see Section 4.3.). Such an increase in risk-aversion leads to an increase in investors' demand for high-quality certification as well as placements of the bond. For instance, Povel et al. (2007) argue that investor incentives to collect information on firms are higher during a recession when expectations of average firm quality are lower. Krylova (2016) finds that credit ratings are

weaker predictors of bond prices during the global financial crisis, suggesting investors should rely less on the credit quality signaling role by rating agencies. In such a situation, bond issuers derive value from a bookrunner relationship. Dick-Nielsen et al. (2021) show that lead underwriters (bookrunners) help reduce the information asymmetry between the issuers and the investors due to their "relationship capital". Hence, we argue that domestic bookrunners are more likely to be chosen by the issuers to certify and place their issues due to the geographic proximity preference of issuers (Lau and Yu, 2010). Lau and Yu (2010) argue that domestic bookrunners can make use of their superior information about domestic issuers and reduce the cost in order to improve their competitiveness (Butler, 2008).

Consequently, during non-crisis periods when the degree of risk aversion is lower we suggest that issuers would benefit from the placement role of the bookrunners rather than their certification roles. Also, the importance of certification could be weakened during normal times due to the "ancillary pressure effect". Although low government bond yields post-crisis have increased investor demand for corporate bonds due to reduced risk aversion (Duca et al., 2016), it has also increased the pressure on banks to undertake a large number of bookrunner roles to boost their ancillary returns on capital. For instance, for our sample data, the average number of bookrunners doubled in recent years from 3.2 in the pre-crisis period (before November 2006) to 6.3 in the post-crisis period (after October 2012). This, in turn, results in lower corporate flexibility to select preferred bookrunner group composition resulting in inefficiently constructed bookrunner groups (Owen, 2018). Hence, the larger bookrunner syndicate driven by the market power of banks may not be efficient. Practitioner and financial press coverage highlights that bookrunners have become more aggressive in their bond origination strategies and have done more to emphasize the link from loan commitments to firms and winning bond bookrunner business from borrowing firms (Kaya and Meyer, 2013; Wyman, 2016; Stothard, 2013).

3. Sample construction, dependent variable, and empirical determinants

In this section, we set out the sample selection process, our dependent variable of the quality of bookrunner service, and our main proxies for bookrunner syndicate geography. We present an overview of the sources and definitions for each variable in Table 1 (panel A bookrunner syndicate structure variables, panel B bond pricing and outcomes variables, and panel C instrumental and control variables).

[Insert Table 1 about here]

3.1. Sample construction

We collect our sample from a Dealogic search of all euro-denominated senior unsecured bond tranches issued by Western European firms from January 1, 2001, up to December 31, 2020.[7] We exclude tranches issued by financial institutions and secured tranches due to their distinct risk profile.[8]

In addition, we exclude non-investment grade tranches. This allows us to carry out a stronger test of the impact of bookrunner syndicate quality. It also makes our sample more comparable as the at-issue pricing variable, which we use to proxy for quality of service, is consistent. Investment-grade bonds are priced as a credit spread over a benchmark rate, the mid-swap rate in the euro-denominated market, while non-investment grade bonds are priced on a total yield basis (Blume et al., 1991).[9] Moreover, the high-yield bond market is still very small, constituting only 3.2% of European bond issuance in this period (source: Dealogic).

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[7] Dealogic defines Western Europe as including Austria, Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Switzerland and the UK. Several recent studies has used Dealogic as their primary source of bond market data (Duca et al, 2016, Ayala et al., 2017, Hale et al., 2020).
[8] Stulz and Johnson (1985) note that the value of secured debt is largely linked to the value of the collateral assigned to the bond as opposed to the overall credit worthiness of the firm.
[9] A small number of unrated tranches remain in our sample. Dealogic classifies these tranches as investment grade where the issuer and security have investment grade characteristics and the security has no covenants. Removing these tranches from our analysis does not affect our empirical results.

Within our investment-grade sample, we aim to select euro-denominated corporate bonds that are comparable in terms of the degree of certification and placement work required by the bookrunner syndicate. We, therefore, focus on tranches that are in principle open for investment from the entire European institutional investor universe. This leads us to exclude tranches that are domestically placed, privately placed, single bookrunner-led, retail-targeted, smaller than EUR 200m, fungible[10], and with a maturity of less than 1 year. After speaking to practitioners, we ascertained such tranches require limited placement work, being placed with a small subset of European investors. The corporates issuing them are also expected to show lower credit spread sensitivity for issuers due to the reduced transaction costs associated with these offerings (Blackwell and Kidwell, 1988). Finally, we retain only tranches for which we have issuer-level information. These adjustments produce a sample of 2,409 bond tranches issued by 356 firms. We report summary statistics for these tranches in Table 2.

[Insert Table 2 about here]

3.2. At-issue credit spread as a measure of the quality of bookrunner services

Following Butler (2008) and Lau and Yu (2010) we measure the quality of bookrunner service using the at-issue credit spread on bond tranches relative to the benchmark mid-swap rate, which is an inverse measure of the price obtained. The euro mid-swap rate is the fixed-rate leg of an interest rate swap where the floating rate leg corresponds to the prevailing 6-month Euribor. It is the dominant metric for pricing euro-denominated bond offerings given the absence of a single government bond rate for the Eurozone.[11,12]

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[10] These are known as taps. Taps have the same terms and conditions as an existing bond and effectively result in an increase in the outstanding amount of the bond. Taps tend to be sold to a small number of existing holders of the bond.

[11] Alternative proxies for bookrunner quality can include fees and tranche characteristics including size and tenor. However, tranche characteristics are difficult to interpret as measures of issue quality without an understanding of issuer's optimal preferences.

[12] The at-issue credit spread is quoted in key trade publications including Thomson Reuters' International Financing Review (IFR) and Euromoney Institutional Investors' GlobalCapital. For example, in "Blue chips thrive as EDF takes EUR 2bn, Daimler goes to 10 years," GlobalCapital, September 4, 2012 describes the French utility

We note that various papers of financial intermediary quality have also utilized bookrunner fees as a measure of the quality of service, assessing whether higher-performing intermediaries charge a premium fee for their services (Golubov et al., 2012) or have lower costs for performing their role, which can translate into lower fees (Lau and Yu, 2010). As neither issuers nor bookrunners are required to report fee information, only a handful of our bond tranches disclose them. In addition, fee information is likely to be less informative for our sample tranches. The empirical evidence shows that there are no statistically significant changes in the underwriting fees when employing non-domestic underwriters/bookrunners (Lopez and Spiegel, 2014). Moreover, bond market fees are typically negotiated in advance and are more closely linked to borrower and tranche parameters, such as credit quality and tenor (Lopez and Spiegel, 2014, Gu et al., 2019).

We collect data on the at-issue credit spread from Dealogic, which records the pricing details from the tranche prospectus. For fixed-rate tranches where Dealogic did not record an at-issue spread, we calculate this manually using the at-issue yield to maturity from the bond prospectus and deducting the benchmark mid-swap rate at the date of issuance. The spread over mid-swap is not available for the 101 floating rate tranches in our sample, being priced as a credit spread over 3 months Euribor. For these tranches we approximate the spread over mid-swaps by using the 6m Euribor vs 3m Euribor basis spread, being the cost of entering into an interest rate swap where one party pays 6m Euribor and the other party pays 3m Euribor. As historic data on this swap contract is available from January 2004, we can apply this calculation to 70 out of the 101 floating rate tranches.[13]

Following this process, we have at-issue credit spread details for 2,409 tranches. The mean (median) spread is 1.151% (0.850%). Despite our sample period covering the global

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as having "...sold a EUR 2bn 10 year bond in January [2012] that had a 3.875% coupon and was priced at 168.6bp over mid-swaps."

[13] Excluding floating rate tranches does not affect our overall results.

financial crisis and the eurozone crisis, the mean figure is comparable to the 1.350% treasury spread reported by Fang (2005) for her subsample of bonds underwritten by high reputation bookrunners, which highlights the low credit risk nature of our sample bonds.

3.3. Bookrunner geography and other syndicate decision criteria

Our key explanatory variable for bookrunner syndicate geography is the proportion of non-domestic bookrunners in the overall syndicate. We identify domestic bookrunners as banks headquartered in the same country as the issuer. We focus on the headquarter location at the time of issue and do not retrospectively account for the effects of mergers amongst bookrunners or issuing firms. We collect this information from Dealogic or, where unavailable, manually from the relevant bond prospectus. Table 2 shows non-domestic bookrunners account for 69.80% of the bookrunner syndicate for our sample. In 82.10% of cases, a majority of syndicate members are non-domestic bookrunners.

In further analysis, we control for syndicate characteristics including size (number), role allocations, and reputation of the bookrunner syndicate. The mean (median) number of bookrunners is 5.665 (5.000). Carbo-Valverde et al. (2017) find mean (median) syndicate size of 3.32 (3.00), but do not filter domestically placed and sole bookrunner led issues in their sample of euro-denominated corporate bond issuers. In terms of roles, capital markets news sources make clear distinctions between active and passive bookrunners.[14] Table 2 shows that the fraction of active non-domestic bookrunners is identical to the overall proportion of non-domestic bookrunners in the sample, highlighting that this role innovation is mainstream in our sample. Finally, bookrunner reputation is assessed by the percentage of banks that have a top 10 league table position. We construct a sample-specific league table for this purpose, both for all bookrunners and separately for active bookrunners (see Appendix A). We mimic Bloomberg

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[14] It is important for active bookrunners to make this distinction in financial press coverage of the issue, to avoid investors contacting the wrong bank's sales force. In addition, it is generally recognised in the market that the active status is considered to be more prestigious than the passive role.

and Dealscan league table methods in assigning credits equally across the bookrunner syndicate, but we do not retrospectively assign league table credits from acquired banks to acquiring banks. We focus on Top 10 as these are the most frequently published league tables by IFR and Dealogic. We show in Table 2 that 38.60% of active bookrunners are classified as both non-domestic and high reputation.

We also control for existing lending relationships between bookrunners and issuing firms. An existing lending relation should enhance a bookrunner's ability to perform both its certification role, by being more familiar with the issuer's debt documentation, as well as its placement role, by having access to more soft information about the issuer. It could also affect the cost of debt capital for borrowing firms (Lopez-Espinosa et al., 2017; Yasuda, 2005). We collect data on lending relationships between bookrunners and issuing firms from Dealogic. We identify prior lending relationships as the proportion of the bookrunner syndicate that has acted as mandated lead arranger on a loan to the issuing firm within the previous three years. The mean (median) value for this measure is 58.0% (75.0%) suggesting that more than half of the bookrunner syndicate has recently acted as an arranger on a loan to the issuing firm.[15]

In addition, we test the placement capabilities of bookrunner syndicates by collecting bond demand data and allocation data. Bond demand is studied through oversubscription, being the orderbook size divided by the tranche size. Orderbook size is obtained from International Financing Review, Global Capital, and Informa Global Markets (IGM), who collect this information through post-pricing interviews with bookrunners on the transaction. The final orderbook variables used in our analysis are determined following pricing and allocation of the

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[15] Our results are unaffected if we define prior lending relationships based on the number of bookrunners acting as mandated lead arranger, the value of loans provided, or the number of loans provided. They are also unaffected if we examine banks identified in Dealogic as lenders rather than specifically focusing on mandated lead arrangers, or if we restrict the definition of a prior lending relationship to a one-year time period prior to the current issue.

bond, and therefore after the terms have been agreed.[16] These criteria produce a subsample of 1,577 tranches.

Allocation data is sourced from IGM Deal Navigator. An IGM search produces an initial sample of 1,115 tranches that meet our sample criteria over the sample period and matching to Dealogic produces a sample of 739 bond tranches. To clean for data errors, we remove tranches where the sum of geographic or investor type allocations is less than 95% or greater than 105% of the amount issued. We also exclude tranches for which only the geographic or investor type allocation data is available. After matching to control variables, a final sample of 645 bond tranches is obtained. We calculate the proportion of each tranche issued to domestic investors, based on the regional classifications reported in Dealogic.

Although anecdotal, from our conversations with bond market practitioners, it is commonly suggested that some of the key aspects that their clients consider include league table position, bookrunner geography, prior lending relationship, and distribution network. Therefore, taken together, our data set allows us to consider most of the main decision criteria applied by corporate bond issuers in euro-denominated corporate bonds.

3.4. Model specification and instrumental variable

The structure of the bookrunner syndicate is determined by issuer and tranche parameters that also influence credit spreads (Gande et al., 1999; Puri, 1996). Therefore, we estimate our main testing using instrumental variable two-stage least squares (IV-2SLS) regressions that attempt to account for endogeneity in the matching of issuers and bookrunners. First stage regressions examine the determinants of the proportion of non-domestic bookrunners in the issuing syndicate. Second stage regressions examine the determinants of at-issue credit spreads after-controlling for bookrunner-issuer matching.

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[16] Focusing on final order orderbook demand minimizes endogeneity concerns due to revision of the offer terms in response to initial demand in the intraday market. Our data captures the single direction of the relation whereby the final terms drive the reported orderbook size.

To estimate these models, we require an instrument that influences the geographic make-up of a bookrunner syndicate but not the at-issue credit spread. We follow Butler (2008) and use the annual bond market size in each country as our instrument. We identify bond market size as the total number of bond tranches (investment-grade and high-yield) issued in each country each month and we allow the variable to vary by year-month to improve cross-sectional heterogeneity. We expect that greater issuance volume in the domestic bond market encourages bookrunners to locate their headquarters in that country. We, therefore, anticipate a negative relation between national bond market size and the proportion of non-domestic bookrunners in the syndicate.[17]

We expect no relation between local bond market volume and at-issue credit spreads after controlling for other tranche and issuer characteristics such as rating and tenor. To partially validate the exclusion restriction, we confirm that the Ln (No. of Bonds) variable is uncorrelated with at-issue credit spreads (p=0.182). The mean (median) value for annual national bond issuance is 17.329 (12.000) issues, with variation by country and year-month.

3.5. Control variables

We control for a range of other firm and tranche-specific variables that prior studies have found to influence the at-issue credit spread and the choice of bookrunners.[18] The firm characteristics we examine are size, profitability, the proportion of intangible assets, leverage, growth opportunities, and a majority government ownership dummy. The average issuer has EUR 73.128 bn of assets, leverage of 32.6%, and generates operating profit of 11.3% of total assets. 4.3% of our sample firms have majority government ownership. Credit spreads for such firms are lower due to expected government support in cases of financial distress. These figures show that our sample firms are generally large and low credit risk bond issuers.

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[17] We discuss the robustness of our findings to alternative instrumental variables n Section 4.5.3 of the paper.
[18] See Asquith et al. (2013), Elton et al. (2001), and Shivdasani and Song (2011) for a summary of these variables.

The tranche-specific parameters we include are credit rating, maturity, tranche size, and a dummy for multi-tranche offerings. We also add a variable for the spread between AA and BBB-rated bonds in the calendar quarter of the focal bond issue to control for changes in the relative risk premium on low-rated bonds. We measure credit risk using a numerical scale of the S&P tranche rating, ascending from 1 for AAA to 10 for BBB-, and 11 for unrated tranches. The sample mean of 7.728 lies between an A- and a BBB+. We follow convention in bond market studies and include dummies for each tranche rating in regressions (Fang, 2005).[19] The mean tranche tenor is 7.78 years and the size is EUR 0.779bn. Both are in line with benchmark index standards.[20] 44.2% of our sample tranches are part of multi-tranche offers. The mean (median) spread between AA and BBB-rated bonds is 1.263% (1.091%).[21]

4. Empirical analysis

Our empirical findings are organized as follows. In 4.1 we present summary statistics of our key bookrunner, bond pricing, and control variables by country. 4.2 discusses our main findings regarding the bookrunner syndicate geographic make-up, 4.3 analyses the crisis and non-crisis periods, and 4.4 the robustness tests.

4.1. Summary statistics by issuer country

We present summary statistics for key bookrunner, bond pricing, and control variables by issuer country in Table 3. The summary statistics highlight two key issues relevant to our subsequent empirical analysis and research methods. First, corporate issuers from smaller economies are more likely to use non-domestic bookrunners. French and German firms are the most active issuers in the euro-denominated corporate bond market during our sample period,

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[19] All results are unchanged if we use dummy variables on a five-point scale covering AAA, AA, A, BBB, and unrated bonds, or if we include the continuous credit rating score as alternative explanatory variables.
[20] iBoxx requires a EUR 0.5bn minimum issue size and includes a 5-7 year and a 7-10 year index.
[21] Ideally, our risk premium measure would be the difference between AAA and BBB rated corporate bonds, but the limited number of AAA rated issues in the European market render this definition of the variable unsuitable in practice.

followed by the UK and Italian issuers. These are also the only four countries where fewer than 75% of non-domestic banks make up the bookrunner syndicate. This basic relation supports our use of national bond market size as an instrument to identify the selection of non-domestic bookrunners in the bookrunner syndicate. There are no obvious patterns in bookrunners having previously acted as mandated lead arranger in the loan market, aside from the limited data points for Austria and Ireland.

Second, issuers from Southern European countries have noticeably higher credit spreads, reflecting their perceived credit risk during the global financial crisis. However, within this group, we do observe variation in the use of non-domestic bookrunners depending on the size of the national bond market. For example, Greek bond issuers use an average of 91.8% non-domestic bookrunner and the corresponding figure for Italian issuers is 67.9%. This suggests that our subsequent findings are not driven solely by tranches issued by firms headquartered in financially distressed Southern European countries.

[Insert Table 3 about here]

Firm and tranche characteristics including firm size, credit rating, and maturity that affect bond pricing vary by issuer domicile and provide some initially surprising results. For example, the median credit rating score of 7 in Greece, which corresponds to an AA rating, is stronger than the A rating for issuers domiciled in the Netherlands. However, there are plausible reasons why corporate issuers from low credit-rated countries have higher tranche credit ratings than issuers from some of the highly-rated countries. A number of corporate issuers from these lower-rated countries tend to operate in regulated industries and/or have a degree of government ownership. Countries with higher credit ratings generally have larger corporate sectors and hence a broader mix of eligible corporate candidates for the bond market, including more cyclical and weaker rated firms. The threshold to access the corporate bond

market could also be lower for companies from larger countries given they could be more familiar to a larger investor base (Kang and Stulz, 1997; Massa and Zaldokas, 2014).

4.2. The impact of bookrunner geography on the quality of service

In this section, we report our main findings on the relation between the proportion of non-domestic bookrunners in the issuing syndicate and at-issue credit spreads.[22] Here, and in all subsequent models, we estimate regressions with standard errors clustered at both the firm and year level. We conduct our regression analysis at the tranche level in order to take into account the expected influence of tranche variables, such as tenor and size, on the at-issue credit spread.[23]

Model 1 of Table 4 presents our baseline regression of the proportion of non-domestic bookrunners. Our instrumental variable measuring the size of the local bond market is significant and negatively related to the use of non-domestic bookrunners, at the 1% level. Issuers domiciled in larger capital markets hire a larger proportion of domestic bookrunners. This can arise where larger domestic bond markets encourage a greater number of banks to incorporate in the domestic economy and to offer bookrunner services to local issuing firms.

Our results for control variables show that issues by larger firms and those issued as part of a multi-tranche offering use a higher proportion of non-domestic bookrunners in the sponsoring syndicate. We find a negative correlation between majority government ownership and the use of non-domestic bookrunners. This could suggest that political connections enable domestic bookrunners to win more business from local firms and/or that governments coerce closely-held issuing firms to give business to locally domiciled bookrunners (Borisova et al., 2015; Chen et al., 2017). The coefficient on the AAA-rated dummy is significantly negative,

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[22] Our results are robust to using the yield to maturity as the dependent variable in second stage regressions.

[23] A bond-level analysis would hence be inappropriate as at-issue credit spread is not necessarily a linear function of such variables as tenor and size. Practitioners inform us that at-issue credit spread curve can be exponentially increasing for longer tenors and that investors can demand "price breaks" for deals larger than a certain size.

suggesting that the highest-rated bonds employ more domestic bookrunners. However, the coefficients for some of the remaining rating classes are positive and significant against the omitted group of unrated tranches. Our finding here is mixed with respect to prior literature. Butler (2008) finds no relation between municipality credit rating and the likelihood of appointing a local bookrunner, and Lau and Yu (2010) find that weaker rated corporate bond issuers are more likely to appoint a local lead underwriter.

[Insert Table 4 about here]

In Model 2, we present the results for second stage regressions of the relation between bookrunner geography and quality of service. After controlling for issuer-bookrunner matching, we find a significant positive relation between the proportion of non-domestic bookrunners and at-issue credit spreads, at the 1% level. This suggests a benefit to using domestic bookrunners and supports our view that a syndicate skewed towards domestic bookrunners provides a higher quality of service (Drucker and Puri, 2005).

Our control variables in our main models in Table 4 are generally consistent with prior findings on bond pricing determinants (Andres et al., 2014; Gande et al., 1999; Puri, 1996). We find that credit spreads are higher in larger offerings and increase with leverage, which we attribute to their correlation with default risk. As expected, at-issue credit spreads are generally lower for higher-rated bonds. We find that larger and more profitable firms pay lower credit spreads on bond tranches, again supporting credit risk arguments, and there is weak evidence that firms with stronger growth opportunities pay lower spreads on newly issued bonds.

Considering the range of bookrunner functions, we assess several possible drivers of the observed higher quality of service provided by syndicates dominated by domestic bookrunners. In following sections, we examine the role of active bookrunners, the size of the investor network, investors allocation, and oversubscription.

4.2.1. Active bookrunners

Our main model controls for the proportion of bookrunners who have a prior lending relationship with the firm and are hence arguably the best placed to be evaluators of the riskiness of the firm. In addition to this test, in Model 1 of Table 5, we consider only the proportion of active non-domestic bookrunners, thereby excluding the passive bookrunners. Our main result on the significantly positive relation with % of non-domestic bookrunners in Table 4 continues to hold.

[Insert Table 5 about here]

4.2.2. Size of investor network

Next, we consider whether domestic bookrunners offer higher placement benefits. The interpretation could be that our results reflect the domestic information advantage of domestic bookrunners in the largest European economies (Chemmanur and Krishnan, 2012), namely the UK, France, and Germany. These countries are home to most of the largest European banks, constitute 69.8% of our sample, and are characterized by syndicates with a higher proportion of domestic bookrunners. Hence, the "better quality" service of domestic bookrunners could simply reflect the ability of higher reputation bookrunners from major economies to pressure more investors into buying their offerings.

In Model 2, we consider the impact of the proportion of non-domestic active bookrunners with a top 10 league table position. Appendix A gives the detail of the top bookrunners during our sample period. The findings show a positive impact on the credit spreads. This shows that the market power of the top non-domestic active bookrunners does not result in a better at-issue spread. In Model 3, our main explanatory variable is the proportion of non-domestic bookrunners headquartered in the largest three European economies of France, Germany, and the UK. Bookrunners domiciled in these countries should provide access to investors in the largest European capital markets and offer the most meaningful search benefits

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to the employment of non-domestic bookrunners. The positive relation with the at-issue credit spread remains with a 1% level of significance.

In Model 4 we keep the same explanatory variable as Model 2 and focus only on tranches where there is no domestic top 10 bookrunner. This could reflect an issuer's preference for sub-top 10 bookrunners or be the result of the issuer's home location, with countries such as Belgium, Greece, and Switzerland not being home to a Top 10 bookrunner. If market power effects are the primary drivers of bookrunner syndicate selection, the benefit of a non-domestic top-tier bookrunner is most acute for these issuers. However, we do not find a significant relationship between the proportion of non-domestic active Top 10 bookrunners and the at-issue credit spread. This suggests that those issuers who do not have access to a high reputation domestic bookrunner do not have any preference for either domestic or non-domestic active bookrunners in the sponsoring syndicate.

4.2.3. Investor allocation and bond demand

Our subsamples of allocation and bond demand data allow us to do additional, direct testing of the effectiveness of the placement function. In Table 6, we present OLS regressions of %Domestic and oversubscription levels. In Model 1, we find a negative relation between non-domestic bookrunner use and % of domestic investor allocations, significant at the 1% level. However, in Model 2, we do not find that appointing more non-domestic bookrunners is associated with higher oversubscription levels.

[Insert Table 6 about here]

For control variables in this subsample research, we find that majority government-owned firms allocate a higher proportion of their bonds to domestic investors and that a higher proportion of longer tenor bonds are placed with non-domestic investors. Government-backed firms may be pressed to favor domestic investors in allocations, while long-term bonds are

attractive only to a sub-set of long-term investors such as pension funds and must be marketed internationally to attract sufficient demand from these investor groups.

We also observe that bookrunners with an existing lending relationship attract larger orderbooks. This likely reflects that they have acted as bookrunner for the issuer before, so are more experienced in marketing their debt securities. In addition, larger firms and less levered firms are associated with lower oversubscription levels. The somewhat surprising firm size relationship is probably the result of investor exposure concerns, as larger firms tend to have more existing public debt outstanding. Smaller tranches and longer-dated tranches also have a weakly positive relationship with oversubscription levels. The latter is likely the result of short-dated tranches tend to be less appealing to institutional bond investors such as pension funds and insurers.

In summary, we find that syndicates with a higher proportion of domestic bookrunners achieve lower at-issue credit spreads, even though they are not associated with meaningful improvements in certification or investor subscription. Considering the combination of bookrunner functions we set out in Section 2, this lends credence to our view that domestic bookrunners run a higher quality placement. Their soft information advantage converts more prospective investors into committed, price-competitive buyers.

4.3. Impact of the crises on bookrunner syndicates and at-issue credit spreads

We view the financial crises as an exogenous shock to financial markets that affected (i) the incentives of investors to rely on bond market bookrunners to inform them about the quality of the issuing firms and, (ii) the importance of bookrunner location advantage in ensuring a competitive placement of bonds. We, therefore, examine whether and how the relationship between bookrunner geography and at-issue credit spreads has changed surrounding the global financial crisis and eurozone crisis periods.

To highlight the structural changes in the euro-denominated bond market over the sample period, Figure 1 presents quarterly data on the number of bond tranches issued and the average at-issue credit spread. Spreads decline initially and reach a minimum between 2003 and 2007 as banks compete with bond investors to offer lower-cost financing. As expected, we see a sharp spike in credit spreads in Q3 2008. Although spreads decline after this point, we see a slight rise in the credit spreads during the eurozone crisis periods. The average value remains higher than at any stage in the pre-crisis period. This clear demarcation point in the data supports a focus on four sub-periods based on Petmezas and Santamaria (2014): (i) Pre-Financial Crisis period (January 2001-November 2006), (ii) Financial Crisis period (December 2006 – October 2009), (iii) Eurozone Crisis period (November 2009-September 2012), and (iv) Post-Financial and Eurozone crisis period (October 2012-December 2020).

[Insert Figure 1 about here]

Table 7 reports mean comparisons for bookrunner syndicate characteristics, instrumental, and tranche variables. The mean (median) at-issue credit spread is 0.705% in the pre-crisis period, which increases significantly to 1.940% in the crisis period and to 1.632% in the eurozone crisis period. The mean syndicate size also increases significantly from 3.179 to 3.913 in the crisis period and to 5.089 in the eurozone crisis period. Likewise, the mean fraction of Top 10 active non-domestic bookrunners increases significantly from 40.1% to 50.6% in the crisis period and it remains at the pre-crisis level in the eurozone crisis. These results provide some evidence that issuers have increased syndicate size by employing more high reputation non-domestic active bookrunners in the crisis period. We find similar evidence comparing the pre-crisis and eurozone crisis periods.

[Insert Table 7 about here]

For tranche characteristics, we find a reduction of a grade in the mean credit rating for tranches issued during the financial crisis and eurozone crisis, suggesting a reduction in credit quality. This is significant and supported by a reduction in the frequency of multi-tranche offerings post-financial and eurozone crises.

The absence of underlying economic demand for increased syndicate size provides some support to our explanation that during the financial and eurozone crisis period bookrunners use provision of bank loans to win bookrunner mandates, which leads to an increase in syndicate size (Kaya and Meyer, 2013; Stothard, 2013), even if this leads to otherwise higher costs in the bond market. We examine the impact of the financial crisis on the relation between bookrunner syndicates and at-issue credit spreads in Table 8.

[Insert Table 8 about here]

In models 1 to 4, we replace year dummies in first and second stage regressions with a dummy set equal to one for all tranches issued during the four sub-periods. As expected, the pre-financial crisis and the post-financial and eurozone crisis variable are highly significant and negatively related to at-issue credit spreads, whereas the financial crisis and the eurozone crisis variable are highly significant and positively related to at-issue credit spread. However, the inclusion of this variable does not affect the significant and positive relation between non-domestic bookrunners and at-issue spreads.

To examine the impact of the crisis in more detail, we estimate separate regressions for the sub-periods in models 5 to 8. Consistent with our prediction, the results highlight that a significant relation between bookrunner geography and at-issue credit spreads during the financial and the eurozone crisis period drives our main findings. Prior to the financial crisis and post the financial and the eurozone crisis, bookrunner geography is unrelated to bond pricing.

Our results contrast with those of Shivdasani and Song (2011), who find that bookrunner characteristics are more closely associated with quality of service during a stock market boom, as compared to a bust period. Our contrasting findings most likely reflect the international focus of our sample and our focus on investment-grade securities. Investors relied heavily on credit rating agencies to certify the value of these securities prior to the financial crisis. We propose that reduced trust in credit rating agencies during the post-crisis period (Krylova, 2016), leads investors to place greater reliance on the type of soft information that is more likely to be available to domestic bookrunners.[24]

4.4. Robustness tests

4.4.1. Sample exclusions

In this section, we set out a number of robustness tests to our main finding in Table 4. We address concerns that our findings are driven by a small number of tranches issued by firms headquartered in specific European capital markets through sample exclusion tests. We present these results in Table 9.

[Insert Table 9 about here]

In Model 1, we exclude issuers from Switzerland and the UK to address concerns that our results are biased by the inclusion of issuers for whom the Euro is not the primary currency.

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[24] We also examine the at-issue credit spread for the Covid-19 pandemic period. Similar to other crisis periods, we expect the credit spread to increase significantly and the relation between bookrunner geography and credit spread to be stronger during the pandemic. Our preliminary investigation is for euro-denominated public bond issues made between January 2019 - December 2020. We report the results in Appendix B for brevity. Panel A of Appendix B shows that the credit spread has increased significantly in the post-Covid-19 compared to pre-Covid19 period. However, the decline is relatively smaller compared to the decline in financial and eurozone crisis. Panel B does not report any significant relation between proportion of non-domestic bookrunners and at-issue credit periods during Covid-19 pandemic. Clearly this crisis is different from the other crises we examine and this result could potentially highlight the impact of social restrictions and change in workplace environment (work-from-home/work-from-away) during the pandemic. The improvement in technology overtime coupled with such restrictions has resulted in bond issuance process to be conducted virtually, arguably creating a level field for domestic and non-domestic bookrunners.

In Model 2, we exclude issuers from countries where governments and corporate issuers are known to have suffered higher credit spreads during the financial and eurozone crisis: Greece, Ireland, Italy, Portugal, and Spain. Summary statistics in Table 3 highlight that the largest countries with more bookrunners have more firms choosing domestic bookrunners. Therefore, in Model 3, we restrict our analysis to issuers from the largest six Western European countries by GDP: France, Germany, Italy, the Netherlands, Spain, and the UK. Focusing on these countries produces a more homogeneous sample of issuers from economies at a similar stage of financial development. In addition, removing issuers from smaller countries reduces concerns that our results are driven by the simultaneous inclusion of countries with high credit spreads and few domestic bookrunners. In each of these subsamples, the positive relation between non-domestic bookrunners and at-issue credit spreads remains positive and statistically significant. [25]

4.4.2. Bookrunner lending commitments in the domestic economy

In this section, we aim to address concerns surrounding the interpretation of our domestic bookrunner variable. In our testing so far, we follow prior literature and identify bookrunner nationality based on the location of the firm's corporate headquarters (Butler, 2008). We now focus directly on lending commitments by bookrunners to measure bank involvement in national lending markets.

We analyze lending commitments by country and by the lender during our sample period for each of the 13 Western European countries in our sample using Dealogic data. This

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[25] Thus far, we have controlled for additional characteristics of the bookrunner syndicate, including syndicate size, the use of active bookrunners, and bookrunner reputation by modifying our main syndicate geography explanatory variable. We also estimate tests where we add additional controls in our regression models for the total number of bookrunners, number of active bookrunners, the use of passive bookrunners not involved in the placement of tranches, and the league table ranking of syndicate bookrunners as a measure of reputation. Adding these variables to our base regression in Model 1 of Table 4, we find that syndicate size is associated with higher at-issue credit spreads. Controlling for these variables does not affect the positive and significant relation between the proportion of non-domestic bookrunners in the sponsoring syndicate and at-issue credit spreads.

allows us to identify total and average lending by each bank in each national economy, lending as a proportion of the bank's total balance sheet lending commitments and their relative size over the sample period.

These tests provide an alternative, and more direct, a measure of bookrunner presence in each national economy by considering the amount of its own balance sheet it has dedicated. As lending is typically considered a necessary entry ticket to bond business, particularly in Europe, it is also a proxy for the size of a bank's debt capital market franchise in a particular country.

We use this data to build a number of measures of the locality of syndicate bookrunners in the domicile of the issuing firm based on their lending commitments. If our previous results hold, we now expect to find a negative relation between our measures of bookrunner locality and at-issue credit spreads. In Model 1 in Table 10, our bookrunner geography measure is the natural logarithm of total lending by each bookrunner in the sponsoring syndicate to corporate borrowers in the issuing firm's headquarter country. We find that the coefficient for this measure is significantly negative at the 1% level, which shows that credit spreads are lower when sponsoring bookrunners to have a stronger lending presence in the issuing firm's home country.

[Insert Table 10 about here]

We extend this analysis in Models 2 to 4 in Table 10 to consider a number of alternative measures of national lending by sponsoring bookrunners. In Model 2, we take the natural logarithm of average lending commitment by each bookrunner to all firms in the country of the issuing firm. This controls for variation in bookrunner syndicate size. The coefficient for this variable remains significant and negatively related to credit spreads. In Model 3, we examine the relative importance of the issuer country to the lending bank, defined as the fraction of each

bookrunner's total lending over the sample period to the issuer's home country, and we average this across all syndicate members. We again find a significant and negative relationship with the at-issue credit spread. In Model 4, our main explanatory variable is the sum of total lending by each bookrunner in the issuing firm's home country weighted by the relative size of each bank in the European lending market, giving greater weight to larger lending banks. Supporting the results of the earlier models, we again find the coefficient for syndicate locality is significant and negatively related to at-issue credit spreads.

4.4.3. Alternative instrumental variables

As a final robustness test, we examine the sensitivity of our results to alternative instrumental variables in first stage regressions of non-domestic bookrunner use. In Section 3.4., we report no significant correlation between the natural logarithm of annual corporate bond issuance in the national market and the second stage dependent variable, at-issue credit spread. This provides confidence that our instrument fulfills the exclusion restriction. Nonetheless, if the current year bond market size is correlated with local economic and/or credit market conditions an indirect relation could exist between these variables after controlling for other firm and tranche characteristics and the instrument could fail to meet the exclusion restriction.[26]

To examine this issue in more detail, in Table 11 we present second stage regressions of at-issue credit spreads based on alternative instrumental variables in first stage regressions of bookrunner geography. For brevity, we do not report the coefficients for control variables and present only the overall regression statistics and the coefficients for the intercept and the main explanatory variable. In Models 1 to 3, we use one, two, and three-year lags of the first stage instrumental variable respectively. In doing so we aim to reduce any correlation between national bond market size and bond pricing that is driven by current credit market conditions.

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[26] Larcker and Rusticus (2010) and Lennox et al. (2012) provided a detailed discussion of the assumptions made and problems faced if the instrumental variable does not meet the exclusion criteria.

For each model, the coefficient on the proportion of non-domestic bookrunners remains positive and significantly related to at-issue credit spreads.

[Insert Table 11 about here]

It is also possible that the size of the local bond market indicates the availability of private credit, with a larger bond market corresponding to a stronger private credit supply and thus a lower borrowing cost. Alternatively, a larger bond market reflects a limited supply of private credit and thus a higher borrowing cost. To examine the robustness of our findings to these arguments, in Model 4, we use the number of euro-denominated bank loans provided to firms each month in each country as an alternative measure of credit market size. In Model 5, we the total number of bonds and bank loans made to firms in the month in each country as a combined measure of credit market size. In both cases, the coefficient for non-domestic bookrunners remains positive and significant at the 1% level to at-issue credit spreads. This provides confidence that our results are not sensitive to the measure of national bond market size and that they are not biased by a potential correlation between bond market size and contemporaneous credit market conditions that also affect at-issue credit spread.

5. Conclusions

In this paper, we examine the impact of bookrunner syndicate geography on the quality of service provided in corporate bond issues, based on the at issue-issue credit spread on newly issued bonds. This research extends prior evidence studying the determinants and influence of bookrunner relationships with issuing firms by considering the make-up of the entire bookrunner syndicate and directly testing their roles.

We use IV-2SLS regression models to control for endogenous matching of bookrunners and bond issues. Our sample is 2,409 euro-denominated investment-grade public bond tranches issued by 356 firms in 13 Western European countries from 2001 to 2020. The focus on the

euro-denominated corporate bond market provides us with the empirical benefits of a heterogeneous set of issuers and bookrunners with a homogeneous bond product, governed by centralized EU regulation. Also, by exclusively considering investment-grade tranches we perform a strong test of the value of bookrunner services that are most applicable to regular bond issuers.

We argue that there is no perceived differentiation in certification function of domestic and non-domestic bookrunners, at least in normal times, as these functions are typically legalistic and fulfilled by their legal department. However, we argue that the certification role would be important during difficult economic conditions, such as in recessionary periods due to increased investors risk aversion and reduced trust on credit rating agencies. However, domestic bookrunners have greater role to play in placement function due their locational advantage and soft information advantage compared to their non-domestic counterpart. We argue that this role is important during both normal and crisis periods.

Our findings show that bookrunner syndicates with a higher proportion of domestic banks provide higher quality services as reflected in their at-issue credit spreads and propose that this relates to their soft information advantage derived from their geographical proximity to issuers. We find that our main results are driven by tranches issued during both the global financial crisis and the eurozone crisis. We propose this is due to the increased role of both certification and placement functions of domestic bookrunners. Before the global financial crisis and after the eurozone crisis, we do not find any relation between bookrunner syndicate geographic make-up and quality of service.

Our results are robust to a wide range of additional controls and sample filters. We exclude issuers from smaller economies with few domestic bookrunners, issuers headquartered in countries most affected by the European sovereign debt crisis, firms without access to high

reputation domestic bookrunners, and we examine the sensitivity of our findings to alternative instrumental variables.

Our findings have important implications for the decision of some corporate treasurers. When selecting banks, they should place greater emphasis on their placement strategy to optimise the at-issue credit spread, particularly during weaker market conditions, such as in recessionary periods. While acknowledging treasurers' need to rotate roles, our results suggest that issuers should appoint at least one domestic bank to each syndicate.

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Table 1

Variable definitions and data sources.

The table presents variable definitions for bookrunner (BR), bond, and firm characteristics for a sample of 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020.

Variable Name	Calculation	Source
Panel A: Bookrunner syndicate structure variables		
Number of BRs	A count of the total number of bookrunners on a tranche.	Dealogic, Bond prospectus
% of Non-domestic BRs	The percentage of bookrunners headquartered in a different country to the issuer.	Dealogic, Bond prospectus
Majority non-domestic BRs	An indicator variable equal to one if more than 50% of syndicate members are headquartered in a different country to the issuer, and zero otherwise.	Dealogic, Bond prospectus
% of Non-domestic Active BRs	The percentage of active bookrunners headquartered in a different country to the issuer.	Dealogic, Bond prospectus, Financial press
% of Non-domestic Active Top 10 BRs	The percentage of active bookrunners headquartered in a different country to the issuer and who are ranked as a Top 10 bank by deal value during the sample period.	Dealogic, Bond prospectus, Financial press
% of BRs prior lender	The percentage of the bookrunners who have acted as a mandated lead arranger for a loan made to the issuing firm in the three years prior to the current bond issue.	Dealogic, Bond prospectus
Total BR domestic lending	Total lending by each bookrunner in the sponsoring syndicate to firms in the issuing firm's headquarter country.	Dealogic, Bond prospectus
Average BR domestic lending	Total lending by each bookrunner in the sponsoring syndicate to firms in the issuing firm's headquarter country divided by total number of bookrunners.	Dealogic, Bond prospectus
Average balance sheet lending to issuer country	Total lending by each bookrunner in the sponsoring syndicate to firms in the issuing firm's headquarter country divided by total lending by the bookrunner averaged across member of the sponsoring syndicate.	Dealogic, Bond prospectus
BR domestic lending * Bank relative size	Total BR domestic lending x (Total lending by each bank divided by the value of all loans made by all banks during the sample period).	Dealogic, Bond prospectus
Total BR domestic lending market share	Total bank lending for all members of the bookrunner syndicate in the issuing firm's home country divided by total bank lending in the firm's home country.	Dealogic, Bond prospectus
% of Top 10 lenders in BR syndicate	The proportion of the sponsoring bookrunner syndicate in the Top 10 bank lenders in the issuing firm's home country.	Dealogic, Bond prospectus
% of Top 5 lenders in BR syndicate	The proportion of the sponsoring bookrunner syndicate in the Top 5 bank lenders in the issuing firm's home country.	Dealogic, Bond prospectus
Panel B: Bond pricing and outcomes variables		
Credit spread	At-issue yield to maturity minus the benchmark euro mid-swap rate for the equivalent tenor.	Dealogic, Bond prospectus
Yield	At-issue yield to maturity.	Dealogic, Bond prospectus
%Domestic	Allocation percentage to geographic region encompassing issuer's country of incorporation.	IGM Deal Navigator
Oversubscription	Orderbook size divided by tranche size	IFR, GlobalCapital

Table 1 (cont'd)

Variable definitions and data sources.

Panel C: Instrumental and control variables		
Ln (No. of bonds)	The natural logarithm of the number of euro-denominated bond (high yield and investment grade) tranches issued by firms incorporated in each country in each month during the sample period.	Dealogic
Ln (Firm size)	The natural logarithm of the issuer's book value of total assets in € billions.	Worldscope
Profitability	Earnings before interest, taxes, depreciation and amortization (EBITDA) divided by book value of total assets.	Worldscope
Intangible assets	One minus the ratio of net property, plant, and equipment divided by the book value of total assets.	Worldscope
Leverage	Book value of total debt divided by total assets.	Worldscope
Growth opportunities	Book value of total assets plus market value of equity minus book value of equity, divided by the book value of total assets.	Worldscope
Government owned	An indicator variable equal to one if 50% or more of the firm's shares are owned by the national government, and zero otherwise.	Company reports
Credit rating	The numeric value for the S&P rating assigned to the bond tranche on the issue date, ascending from 1 for AAA to 10 for BBB- and 11 for unrated tranches. In regression models we add a series of dummy variables for each rating.	S&P
Ln (Maturity)	The natural logarithm of the tenor of the tranche in years.	Dealogic
Ln (Tranche size)	The natural logarithm of the amount issued in € millions.	Dealogic
Multi-tranche	An indicator variable equal to one if the issuer sells two or more euro-denominated tranches on the same day, and zero otherwise.	Dealogic
AA-BBB spread	The average credit spread for all BBB bonds minus the average credit spread for AA rated bonds in the calendar quarter of the current bond issue.	Dealogic
Pre-Crisis	An indicator variable equal to one if the bond issue takes place before November 2006 and zero otherwise.	Dealogic
Crisis	An indicator variable equal to one if the bond issue takes place between December 2006 to October 2009 and zero otherwise.	Dealogic
Eurozone Crisis	An indicator variable equal to one if the bond issue takes place between November 2009 to September 2012 and zero otherwise.	Dealogic
Post-Crisis	An indicator variable equal to one if the bond issue takes place after October 2012 and zero otherwise.	Dealogic

Table 2

Summary statistics of bookrunner characteristics and control factors.

The table presents summary statistics of a sample of 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020. All variables are defined in Table 1.

	Observations	Mean	Median	St. Dev
Panel A: Bookrunner syndicate structure and credit spread				
Credit spread	2409	1.151	0.850	0.960
Number of BRs	2409	5.665	5.000	3.403
% of Non-domestic BRs	2409	0.698	0.714	0.219
Majority non-domestic BRs	2409	0.821	1.000	0.384
% of Non-domestic Active BRs	2409	0.698	0.714	0.230
% of Non-domestic Active Top 10 BRs	2409	0.386	0.333	0.240
% of BRs prior lender	2409	0.580	0.750	0.401
Panel B: Tranche and firm characteristics				
No. of bonds	2409	17.329	12.000	26.121
Firm size (€bn)	2409	73.128	37.391	124.219
Profitability	2409	0.113	0.106	0.055
Intangible assets	2409	0.696	0.714	0.206
Leverage	2409	0.326	0.320	0.147
Growth opportunities	2409	1.820	1.657	0.778
Government owned	2409	0.043	0.000	0.203
Credit rating	2409	7.728	8.000	2.054
Maturity	2409	7.783	7.000	3.954
Tranche size (€m)	2409	779.885	750.000	413.054
Multi-tranche	2409	0.442	0.000	0.497
AA-BBB spread	2409	1.263	1.091	0.728

Table 3

Summary statistics by country.

The table presents summary statistics separated by the country of the issuing firm's headquarters for a sample of 2409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020. Mean values are reported above medians. All variables are defined in Table 1.

	No. of observations	Credit spread	% of Non-domestic BRs	No. of bond issues	% of BRs prior lender	Credit rating	Maturity	Tranche Size, €m	Firm Size, €bn
Austria	34	1.206	0.867	5.559	0.545	9.382	8.255	567.353	20.975
		[1.015]	[0.833]	[4.000]	[0.750]	[11.000]	[7.003]	[500.000]	[18.248]
Belgium	59	1.232	0.910	5.373	0.617	7.881	9.357	804.915	54.471
		[0.920]	[1.000]	[5.000]	[0.750]	[7.000]	[8.970]	[600.000]	[17.184]
France	740	1.143	0.593	19.031	0.555	7.772	7.934	736.061	62.456
		[0.850]	[0.600]	[18.000]	[0.667]	[8.000]	[7.000]	[650.000]	[39.005]
Germany	615	1.052	0.702	30.293	0.598	7.576	7.156	852.281	119.566
		[0.720]	[0.750]	[17.000]	[0.750]	[8.000]	[6.500]	[750.000]	[66.167]
Greece	11	1.140	0.918	2.000	0.703	7.091	5.689	720.455	7.940
		[0.780]	[1.000]	[2.000]	[0.750]	[7.000]	[5.078]	[600.000]	[7.210]
Ireland	17	1.608	1.000	2.235	0.714	8.059	7.981	676.471	20.460
		[1.250]	[1.000]	[2.000]	[0.818]	[8.000]	[7.000]	[750.000]	[20.971]
Italy	209	1.540	0.679	11.335	0.512	8.483	8.608	785.802	50.990
		[1.220]	[0.667]	[10.000]	[0.500]	[9.000]	[8.000]	[700.000]	[28.471]
Luxembourg	16	2.284	1.000	1.375	0.381	9.563	6.666	653.125	21.903
		[1.965]	[1.000]	[1.000]	[0.000]	[9.000]	[6.999]	[625.000]	[7.442]
Netherlands	107	1.062	0.818	6.224	0.684	7.280	8.477	807.009	78.956
		[0.800]	[0.800]	[6.000]	[1.000]	[8.000]	[8.006]	[750.000]	[22.180]
Portugal	22	1.529	0.840	2.955	0.554	7.864	6.956	622.727	17.795
		[1.165]	[0.833]	[3.000]	[0.550]	[7.000]	[5.790]	[500.000]	[14.087]
Spain	162	1.439	0.779	10.321	0.690	8.574	7.602	792.994	53.763
		[1.100]	[0.767]	[8.000]	[0.800]	[9.000]	[7.296]	[750.000]	[45.851]
Switzerland	90	0.797	0.850	7.211	0.623	5.922	8.204	779.167	53.894
		[0.600]	[0.887]	[4.000]	[0.833]	[6.000]	[7.000]	[600.000]	[49.321]
United Kingdom	327	0.968	0.715	9.245	0.544	7.361	7.675	765.679	57.022
		[0.780]	[0.750]	[8.000]	[0.667]	[7.000]	[7.000]	[750.000]	[34.991]
Total	2,409	1.151	0.698	17.329	0.580	7.728	7.783	779.885	73.128
		[0.850]	[0.714]	[12.000]	[0.750]	[8.000]	[7.000]	[750.000]	[37.391]

Table 4

Regression analysis of impact of bookrunner syndicate geography on at-issue credit spread.

The table reports the results of an instrumental variable two-stage least squares (IV-2SLS) regression predicting the proportion of non-domestic bookrunners (first stage) and the at-issue credit spread (second stage) of 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020. All variables are defined in Table 1. Standard errors clustered at the firm and year level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1 % of Non-domestic BRs	Model 2 Credit spread
Ln (No. of bonds)	-0.067***	
	(0.007)	
% of Non-domestic BRs		1.268***
		(0.406)
% of BRs prior lender	-0.014	-0.002
	(0.013)	(0.046)
Firm size	0.037***	-0.108***
	(0.006)	(0.025)
Profitability	0.173	-1.604***
	(0.114)	(0.456)
Intangible assets	-0.015	-0.091
	(0.028)	(0.090)
Leverage	0.015	0.293*
	(0.041)	(0.156)
Growth opportunities	0.002	-0.097**
	(0.011)	(0.039)
Government owned	-0.140***	0.281**
	(0.027)	(0.130)
Maturity	-0.011	0.138***
	(0.009)	(0.035)
Tranche size	0.017	0.116***
	(0.014)	(0.044)
Multi-tranche	0.049***	-0.006
	(0.011)	(0.043)
AA-BBB spread	0.019*	0.288***
	(0.010)	(0.047)
AAA	-0.353**	-1.405***
	(0.144)	(0.277)
AA+	0.096	-1.905***
	(0.065)	(0.358)
AA	0.070**	-1.054***
	(0.033)	(0.150)
AA-	0.027	-1.074***
	(0.033)	(0.133)
A+	0.041	-0.977***
	(0.026)	(0.100)
A	0.076***	-0.961***
	(0.024)	(0.102)
A-	0.041**	-0.712***
	(0.021)	(0.086)
BBB+	0.054***	-0.530***
	(0.020)	(0.082)
BBB	0.040**	-0.282***
	(0.018)	(0.079)
BBB-	0.012	0.016
	(0.022)	(0.087)
Constant	0.237	-0.210
	(0.278)	(0.898)
Year, Sector and Country dummies	Yes	yes
Number of Observations	2,409	2,409
R^2	0.256	0.454
F-statistic	12.43***	
Wald χ^2		1,434***

Table 5

Alternative definitions of non-domestic bookrunners.

The table reports the second stage regression for instrumental variable two-stage least squares (IV-2SLS) regressions predicting the at-issue credit spread of 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020. Standard errors clustered at the firm and year level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1	Model 2	Model 3	Model 4
% of Non-domestic Active BRs	1.222***			
	(0.394)			
% of Non-domestic Active Top 10 BRs		1.597***		
		(0.540)		
% of Active non-domestic Major economy BRs			1.447***	
			(0.477)	
% of Non-domestic Active Top 10 BRs if no domestic Top 10 Active BR				23.485
				(54.566)
% of BRs prior lender	-0.002	-0.029	-0.018	-1.267
	(0.047)	(0.050)	(0.047)	(2.931)
Firm size	-0.104***	-0.078***	-0.097***	0.035
	(0.024)	(0.023)	(0.024)	(0.275)
Profitability	-1.568***	-1.599***	-1.616***	0.186
	(0.452)	(0.474)	(0.465)	(4.903)
Intangible assets	-0.124	-0.011	-0.120	1.255
	(0.089)	(0.100)	(0.087)	(3.240)
Leverage	0.291*	0.374**	0.294*	-0.001
	(0.161)	(0.168)	(0.161)	(1.362)
Growth opportunities	-0.099**	-0.046	-0.068*	0.291
	(0.039)	(0.043)	(0.039)	(0.949)
Government owned	0.278**	0.092	0.083	-1.479
	(0.128)	(0.116)	(0.112)	(4.154)
Maturity	0.143***	0.121***	0.130***	0.099
	(0.035)	(0.038)	(0.037)	(0.305)
Tranche size	0.115**	0.088*	0.106**	-1.055
	(0.045)	(0.050)	(0.046)	(2.653)
Multi-tranche	-0.003	0.050	0.053	0.505
	(0.042)	(0.043)	(0.043)	(1.001)
AA-BBB spread	0.287***	0.270***	0.297***	-0.675
	(0.046)	(0.049)	(0.048)	(2.343)
Constant	-0.143	0.141	0.173	6.389
	(0.898)	(0.974)	(0.934)	(14.964)
Credit rating, Year, Sector and Country dummies	yes	yes	yes	Yes
Number of Observations	2,409	2,409	2,409	1,902
R^2	0.455	0.399	0.430	n m f
Wald χ^2	1,452***	1,612***	1,555***	22.78

Table 6

Impact of bookrunner geography on domestic allocations and oversubscription

The table reports OLS regressions of the impact of domestic bookrunners on bond investor demand for Euro-denominated public bond tranches issued by Western European firms during 2001-2020. Model 1 has a sample size of 645 and studies the impact on domestic investor allocations. Model 2 has a sample size of 1577 and studies the impact on oversubscription. All variables are defined in Table 1. Standard errors clustered at the firm and year level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1	Model 2
	%Domestic	Oversubscription
% of Non-domestic BRs	-12.619***	0.315
	(3.259)	(0.263)
% of BRs prior lender	1.935	0.436***
	(1.593)	(0.157)
Firm size	-1.039	-0.414***
	(0.897)	(0.077)
Profitability	14.589	-1.394
	(25.975)	(1.508)
Intangible assets	4.560	-0.122
	(4.547)	(0.350)
Leverage	-11.345*	-1.101*
	(6.411)	(0.593)
Growth opportunities	-3.582**	0.393**
	(1.570)	(0.185)
Government owned	8.415*	-0.264
	(4.475)	(0.306)
Maturity	-2.960**	-0.002
	(1.470)	(0.132)
Tranche size	-2.362	-0.535***
	(1.717)	(0.184)
Multi-tranche	-0.706	0.318**
	(1.685)	(0.141)
AA-BBB spread	3.955***	-0.248**
	(1.411)	(0.113)
Constant	97.869***	18.174***
	(33.805)	(3.710)
Credit rating, Year, Sector and Country dummies	yes	yes
Number of Observations	645	1,577
R^2	0.378	0.289

Table 7

Univariate comparison of tranche and issuer characteristics for pre- and post-financial crisis subsamples

The table reports summary statistics for the pre-crisis period (January 2001 – November 2006), crisis period (December 2006 – October 2009), eurozone crisis period (November 2009 – September 2012) and post-crisis period (October 2012 – December 2020) subsamples for 2,409 euro-denominated public bond issues made by 356 Western European firms during 2001-2020. Mean differences are also reported. ***, **, and * denote significance of the mean difference at the 1%, 5%, and 10% levels respectively.
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	Model 1 Pre-Financial Crisis		Model 2 Financial Crisis		Model 3 Eurozone Crisis		Model 4 Post-Financial & Eurozne crisis		Mean Difference				
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Obs.	Mean	(2) - (1)	(3) - (1)	(3) - (4)	(2) - (4)	(4) - (1)
Credit Spread	444	0.705	321	1.940	370	1.632	1770	1.030	1.235***	0.927***	0.602***	0.910***	0.325***
Number of BRs	474	3.179	321	3.913	371	5.089	2002	6.327	0.733***	1.910***	-1.238***	-2.414***	3.147***
% of Non-Domestic BRs	474	0.669	321	0.655	371	0.647	2002	0.724	-0.014	-0.022	-0.077***	-0.069***	0.055***
% of Non-domestic Active BRs	474	0.670	321	0.654	371	0.644	2002	0.726	-0.016	0.026	-0.082***	-0.072***	0.056***
% of Non-domestic Active Top 10 BRs	474	0.401	321	0.506	371	0.425	2002	0.362	0.104***	0.024	0.063***	0.143***	-0.039***
Majority Non-Domestic BRs	474	0.848	321	0.788	371	0.790	2002	0.798	-0.060**	-0.058**	-0.008	-0.010	-0.050***
% of BRs prior lender	474	0.396	321	0.485	370	0.547	2002	0.624	0.089***	0.152***	-0.077***	-0.139***	0.228***
No. of Bonds	471	24.253	321	21.402	370	14.900	2002	13.955	-2.851	-9.353***	0.945	7.447**	-10.298***
Credit Rating	474	6.825	321	6.882	371	7.946	2002	8.086	0.057	1.121***	-0.140	-1.204***	1.261***
Maturity	474	7.606	321	6.653	371	7.545	1996	8.353	-0.953***	-0.061	-0.809**	-1.700***	0.747***
Tranche Size	474	838.470	321	960.312	371	686.623	2002	694.387	121.841***	-151.848***	-7.764	265.925***	-144.084***
Multi-tranche	474	0.338	321	0.333	371	0.224	2002	0.505	-0.004	-0.114***	-0.282***	-0.172***	0.168***

Table 8

Impact of bookrunner geography on at-issue credit spread surrounding financial crisis.

The table reports second stage regression for instrumental variable two-stage least squares (IV-2SLS) regressions predicting the at-issue credit spread of 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020. Unreported first stage selection models examine the determinants of bookrunner syndicate structure. Second stage outcome regressions examine the determinants of at-issue credit spreads against predicted bookrunner characteristics from the first stage selection model. Pre-Financial Crisis is a dummy variable that takes value of 1 for periods between January 2001 – November 2006 and 0 otherwise, Financial Crisis is a dummy variable that takes value of 1 for periods between December 2006 – October 2009 and 0 otherwise, Eurozone Crisis is a dummy variable that takes value of 1 for periods between November 2009 – September 2012 and 0 otherwise, and Post-Financial & Eurozone Crisis is a dummy variable that takes value of 1 for periods between October 2012 – December 2020 and 0 otherwise. All variables are defined in Table 1. Standard errors clustered at the firm and year level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1 Full Sample	Model 2 Full Sample	Model 3 Full Sample	Model 4 Full Sample	Model 5 Pre-Financial Crisis	Model 6 Financial Crisis	Model 7 Eurozone Crisis	Model 8 Post-Financial & Eurozone Crisis
% of Non-Domestic BRs	1.618***	1.704***	1.733***	1.747***	-0.262	5.151**	1.256*	-0.355
	(0.567)	(0.591)	(0.597)	(0.596)	(0.390)	(2.002)	(0.649)	(2.573)
Pre-Financial Crisis	-0.663***							
	(0.069)							
Financial Crisis		0.621***						
		(0.119)						
Eurozone Crisis			0.221**					
			(0.098)					
Post-Financial & Eurozone Crisis				-0.543***				
				(0.160)				
% of BRs prior lender	-0.046	0.013	-0.015	0.012	0.041	0.071	-0.189	0.022
	(0.062)	(0.062)	(0.063)	(0.063)	(0.062)	(0.295)	(0.141)	(0.046)
Firm size	-0.147***	-0.129***	-0.130***	-0.119***	-0.028	0.009	-0.174**	-0.107
	(0.032)	(0.037)	(0.037)	(0.038)	(0.027)	(0.155)	(0.072)	(0.152)
Profitability	-1.910***	-1.992***	-1.554**	-1.602**	-1.215***	-0.458	-0.390	-2.355***
	(0.622)	(0.663)	(0.661)	(0.664)	(0.444)	(3.571)	(1.316)	(0.600)
Intangible assets	0.063	0.094	0.105	0.106	0.066	0.496	0.219	-0.054
	(0.124)	(0.135)	(0.133)	(0.137)	(0.113)	(0.958)	(0.322)	(0.147)
Leverage	0.401*	0.409*	0.359*	0.363*	0.397**	0.408	0.834	0.143
	(0.210)	(0.215)	(0.213)	(0.215)	(0.170)	(0.952)	(0.538)	(0.171)
Growth opportunities	-0.137**	-0.147***	-0.137**	-0.136**	-0.074	-0.250	-0.461**	-0.085
	(0.056)	(0.056)	(0.057)	(0.056)	(0.057)	(0.446)	(0.187)	(0.074)
Government owned	0.293	0.350*	0.394**	0.400**	0.041	0.970*	-0.366	0.319
	(0.179)	(0.185)	(0.183)	(0.182)	(0.098)	(0.495)	(0.344)	(0.379)
Maturity	0.117***	0.130***	0.097**	0.105**	0.282***	0.200	-0.056	0.281***
	(0.045)	(0.046)	(0.049)	(0.050)	(0.038)	(0.174)	(0.105)	(0.049)
Tranche size	0.055***	0.026***	0.031***	-0.000	0.050	-0.017	0.273*	0.127**
	(0.006)	(0.006)	(0.006)	(0.012)	(0.046)	(0.257)	(0.143)	(0.061)
Multi-tranche	-0.032	-0.059	-0.051	-0.057	0.029	-0.120	-0.113	0.071
	(0.052)	(0.053)	(0.052)	(0.053)	(0.053)	(0.231)	(0.128)	(0.087)
AA-BBB spread	0.433***	0.443***	0.545***	0.561***	0.158**	0.423***	0.169**	0.301***
	(0.041)	(0.041)	(0.041)	(0.043)	(0.072)	(0.114)	(0.068)	(0.083)
Constant	0.084	0.160	-0.020	0.660*	-0.794	0.139	-3.295	1.140
	(0.366)	(0.381)	(0.381)	(0.401)	(0.822)	(5.290)	(2.843)	(0.788)
Year dummies	No	No	No	No	Yes	Yes	Yes	Yes
Credit rating, Sector and Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2,147	2,147	2,147	2,147	368	286	311	1,182
R^2	0.350	0.327	0.296	0.295	0.663	0.101	0.481	0.535
Wald χ^2	1002***	869.9***	920.6***	860.9***	1384***	275.5***	1095***	1327***

Table 9

Robustness tests for country exclusions

The table reports the second stage regression for instrumental variable two-stage least squares (IV-2SLS) regressions predicting the at-issue credit spread of 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020. Model 1 excludes issuers from Switzerland and the UK. Model 2 excludes issuers from Greece, Ireland, Italy, Portugal, and Spain. Model 3 includes only issuers from the largest European economies of France, Germany, Italy, the Netherlands, Spain, and the UK. Standard errors clustered at the firm and year level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1	Model 2	Model 3
% of Non-domestic BRs	1.440***	1.529***	1.845***
	(0.444)	(0.450)	(0.516)
% of BRs prior lender	0.035	0.030	-0.031
	(0.057)	(0.052)	(0.051)
Firm size	-0.120***	-0.121***	-0.140***
	(0.028)	(0.026)	(0.031)
Profitability	-1.638***	-1.728***	-1.622***
	(0.537)	(0.511)	(0.523)
Intangible assets	-0.166	-0.050	-0.151
	(0.105)	(0.099)	(0.098)
Leverage	0.312*	0.237	0.203
	(0.176)	(0.164)	(0.163)
Growth opportunities	-0.120***	-0.087**	-0.126***
	(0.044)	(0.044)	(0.044)
Government owned	0.369**	0.267*	0.406***
	(0.146)	(0.137)	(0.152)
Maturity	0.125***	0.148***	0.151***
	(0.042)	(0.039)	(0.039)
Tranche size	0.090*	0.143***	0.144***
	(0.053)	(0.047)	(0.050)
Multi-tranche	-0.040	-0.031	-0.009
	(0.049)	(0.049)	(0.048)
AA-BBB spread	0.281***	0.320***	0.280***
	(0.052)	(0.054)	(0.053)
Constant	0.384	-1.083	-0.897
	(1.045)	(0.957)	(1.038)
Credit rating, Year, Sector and Country dummies	yes	Yes	yes
Number of Observations	1,985	2,015	2,136
R^2	0.422	0.436	0.371
Wald χ^2	1,169***	1,110***	1,150***

Table 10

Impact of bookrunner lending proximity on at-issue credit spreads.

The table reports the second stage regression for instrumental variable two-stage least squares (IV-2SLS) regressions predicting the at-issue credit spread of 1,223 euro-denominated public bond tranches issued by 324 Western European firms during 2001-2012. All variables are defined in Table 1. Standard errors clustered at the firm level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1	Model 2	Model 3	Model 4
Total BR domestic lending	-0.224***			
	(0.071)			
Average BR domestic lending		-0.228***		
		(0.071)		
Average balance sheet lending to issuer country			-0.545***	
			(0.176)	
BR domestic lending * Bank relative size				-0.357***
				(0.116)
% of BRs prior lender	0.022	-0.012	0.042	0.074
	(0.046)	(0.043)	(0.052)	(0.055)
Firm size	-0.066***	-0.062***	-0.085***	-0.086***
	(0.022)	(0.021)	(0.023)	(0.024)
Profitability	-1.491***	-1.478***	-1.780***	-1.747***
	(0.443)	(0.431)	(0.479)	(0.487)
Intangible assets	-0.056	-0.064	-0.088	-0.117
	(0.085)	(0.085)	(0.089)	(0.089)
Leverage	0.259*	0.261*	0.087	0.189
	(0.150)	(0.153)	(0.174)	(0.153)
Growth opportunities	-0.062	-0.079**	-0.028	-0.023
	(0.040)	(0.038)	(0.052)	(0.052)
Government owned	0.132	0.162	0.031	0.085
	(0.110)	(0.112)	(0.122)	(0.113)
Maturity	0.141***	0.131***	0.121***	0.166***
	(0.033)	(0.033)	(0.037)	(0.037)
Tranche size	0.183***	0.130***	0.111**	0.193***
	(0.044)	(0.041)	(0.047)	(0.049)
Multi-tranche	0.078*	0.021	0.106**	0.139**
	(0.043)	(0.039)	(0.050)	(0.055)
AA-BBB spread	0.317***	0.314***	0.305***	0.316***
	(0.045)	(0.045)	(0.046)	(0.046)
Constant	1.487	2.389**	0.875	2.165*
	(0.982)	(1.129)	(0.990)	(1.194)
Credit rating, Year, Sector and Country dummies	yes	yes	yes	yes
Number of Observations	2,409	2,409	2,409	2,409
R^2	0.496	0.508	0.437	0.445
Wald χ^2	1,489***	1,552***	1,420***	1,354***

Table 11

Robustness tests for alternative instrumental variables.

The table reports the second stage regression for instrumental variable two-stage least squares (IV-2SLS) regressions predicting the at-issue credit spread of 2,905 euro-denominated public bond tranches issued by 348 Western European firms during 2001-2020. First stage regressions predict the proportion of non-domestic bookrunners and vary with the instrumental variable described for each regression model below. All variables are defined in Table 1. Standard errors clustered at the firm and year level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
First stage instrumental variable	Ln (No. of bonds), t-1	Ln (No. of bonds), t-2	Ln (No. of bonds), t-3	No. of loans	No. of debt issues
% of Non-domestic BRs	1.893***	2.101***	1.808***	1.808***	1.599***
	(0.452)	(0.602)	(0.612)	(0.561)	(0.482)
Constant	-0.257	-0.272	-0.250	0.369	-0.217
	(0.980)	(1.013)	(0.969)	(0.955)	(0.938)
Firm and Trance controls	yes	yes	yes	yes	yes
Credit rating, Year, Sector and Country dummies	yes	yes	yes	yes	yes
Number of Observations	2,409	2,409	2,409	2,078	2,413
R^2	0.369	0.333	0.382	0.378	0.500
Wald χ^2	1,236***	1,162***	1,262***	5,678***	1,572***

Figure 1
Pattern of tranche issue volume and at-issue credit spreads over time.

The chart presents average statistics for number of tranches issued and at-issue credit spread for 2,409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020.
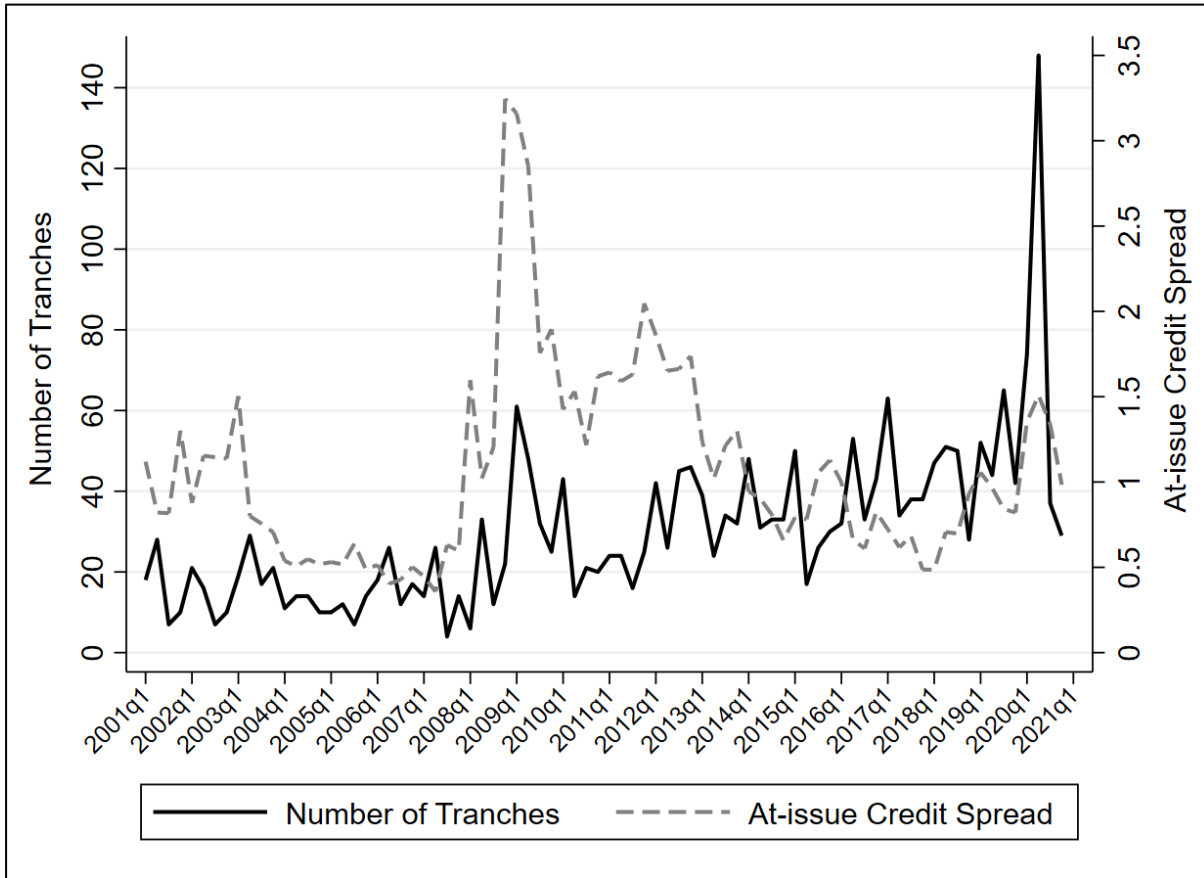
The table ranks investment banks according to their activity as bookrunners for our sample of 2.409 euro-denominated public bond tranches issued by 356 Western European firms during 2001-2020.

Rank	Bookrunner	EUR bn	%	cumulative %	Number of tranches
1	BNP Paribas	154.23	8.53%	8.53%	1053
2	Deutsche Bank	137.05	7.58%	16.12%	740
3	SG Corporate & Investment Banking	123.29	6.82%	22.94%	888
4	HSBC	104.33	5.77%	28.71%	734
5	Credit Agricole CIB	94.23	5.21%	33.93%	686
6	NatWest Markets	94.03	5.20%	39.13%	566
7	JPMorgan	93.48	5.17%	44.31%	560
8	Barclays	93.31	5.16%	49.47%	618
9	Citi	90.70	5.02%	54.49%	615
10	UniCredit	80.69	4.47%	58.95%	607
11	Commerzbank Group	72.52	4.01%	62.97%	509
12	Santander	63.65	3.52%	66.49%	511
13	BofA Securities	63.35	3.51%	70.00%	470
14	Natixis	49.71	2.75%	72.75%	427
15	ING	49.16	2.72%	75.47%	419
16	MUFG	39.92	2.21%	77.68%	381
17	BBVA	36.51	2.02%	79.70%	311
18	Morgan Stanley	35.38	1.96%	81.65%	238
19	Credit Suisse	33.55	1.86%	83.51%	210
20	Goldman Sachs	33.24	1.84%	85.35%	261
21	Intesa Sanpaolo SpA	31.97	1.77%	87.12%	278
22	Mizuho	25.71	1.42%	88.54%	263
23	UBS	17.63	0.98%	89.52%	123
24	BayernLB	16.86	0.93%	90.45%	109
25	Sumitomo Mitsui Financial Group	16.62	0.92%	91.37%	175

Appendix B

Panel A: Univariate comparison of tranche and issuer characteristics for pre- and post-Covid-19 pandemic subsamples

The table reports summary statistics for the pre-covid19 pandemic period (January 2019 – January 2020) and post-Covid-19 pandemic period (February 2020 – December 2020) subsamples for 582 euro-denominated public bond issues made by Western European firms. Mean differences are also reported. ***, **, and * denote significance of the mean difference at the 1%, 5%, and 10% levels respectively.

	Pre-Covid-19 (1)		Post-Covid-19 (2)		Mean Difference
	Obs.	Mean	Obs.	Mean	(2)-(1)
Credit Spread	254	1.024	328	1.415	0.391***
Number of BRs	254	7.299	328	7.208	-0.091
% of Non-Domestic BRs	254	0.746	328	0.716	-0.030*
% of Non-domestic Active BRs	254	0.753	328	0.715	-0.038**
% of Non-domestic Active Top 10 BRs	254	0.328	328	0.338	0.009
Majority Non-Domestic BRs	254	0.845	328	0.778	-0.067**
% of BRs prior lender	254	0.623	328	0.641	0.017
No. of Bonds	254	15.412	328	15.977	0.565
Credit Rating	254	8.271	328	8.063	-0.208
Maturity	254	9.326	328	8.237	-1.089**
Tranche size (€m)	254	676.948	328	817.407	140.459*
Multi-tranche	254	0.637	328	0.587	-0.050

Appendix B (cont'd)

Panel B: *Impact of bookrunner geography on at-issue credit spread surrounding Covid-19 pandemic*

The table reports second stage regression for instrumental variable two-stage least squares (IV-2SLS) regressions predicting the at-issue credit spread of 582 euro-denominated public bond tranches issued by Western European firms during Covid-19 pandemic. Unreported first stage selection models examine the determinants of bookrunner syndicate structure. Second stage outcome regressions examine the determinants of at-issue credit spreads against predicted bookrunner characteristics from the first stage selection model. Covid19 is a dummy variable that takes value of 1 for pre-Covid-19 periods between January 2019 – January 2020 and 0 for post-Covid-19 periods between February 2020 – December 2020. All variables are defined in Table 1. Standard errors clustered at the firm level are reported in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	Model 1 Covid19 pandemic period	Model 2 Pre-covid19	Model 3 Post-covid19
% of Non-Domestic BRs	-32.546	8.971	-34.223
	(155.507)	(15.760)	(288.989)
Covid19	0.522		
	(0.714)		
% of BRs prior lender	-0.293	0.191	-0.950
	(1.831)	(0.487)	(7.649)
Firm Size	0.817	-0.626	1.112
	(4.111)	(0.843)	(9.088)
Profitability	7.799	0.160	18.521
	(37.928)	(5.983)	(151.874)
Intangible Assets	1.675	-0.608	1.789
	(8.554)	(1.896)	(17.433)
Leverage	-3.307	-1.265	-6.406
	(13.349)	(2.883)	(43.728)
Growth Opportunities	-0.804	-0.443	-1.315
	(2.869)	(0.507)	(9.348)
Government Owned	-3.261	0.823	-4.565
	(18.166)	(0.818)	(44.405)
Maturity	0.325	0.570	0.665
	(0.982)	(0.509)	(5.372)
Tranche Size	1.458	0.133	1.157
	(6.002)	(0.326)	(8.274)
Multi-tranche	2.234	-0.904	0.914
	(9.662)	(1.694)	(5.248)
AA-BBB Spread	-0.557	0.593	-0.702
	(3.341)	(0.740)	(6.521)
Constant	11.520	-3.084	16.536
	(54.182)	(7.044)	(129.774)
Credit rating, Sector and Country dummies	Yes	Yes	Yes
Number of Observations	491	203	288
R^2	na	na	na
Wald χ^2	223.40***	195.10***	157.10***