The impact of lending relationships on the choice and structure of bond underwriting syndicates

Carbó-Valverde, Santiago
(scarbo@cunef.edu)
CUNEF and Funcas
+34 91 448 08 92

Cuadros-Solas, Pedro J.
(pedro.cuadros@cunef.edu)
CUNEF
+34 91 448 08 92

Rodríguez-Fernández, Francisco
(franrod@ugr.es)
University of Granada and Funcas
+34 958 24 8346

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Abstract:

We study the effects of prior bank-firm relationships on the choice and structure of debt underwriting syndication. Using a sample of European corporate bonds from 2003–2013, we show that prior lending relationships have a significant impact on syndicate choice and that this effect was particularly sizeable during the crisis. The results also show that reputable banks refrain from joining a syndicate if they perceive that they are matching with less reputable counterparts. We also find that when the syndication choice is driven by lending relationships, there is an associated negative effect on at-issue bond yield spreads.

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1. INTRODUCTION

The common practice in issuing debt in capital markets has shifted from the use of a sole bank as underwriter to underwriting syndication. Simultaneously, the size of these syndicates has increased sharply in recent years, particularly during the financial crisis, as shown in Figure I.

Some investment bankers have reported that underwriting syndication is explained to a large extent by firms' decision to favor their bank relationships in difficult times as a reward mechanism[2]: "*When times are tough and balance sheets scarce, putting your relationship bank on a deal as a passive bookrunner is an easy and also very visible way of rewarding them*"[3]. Furthermore, the increase in syndicated deals has led investment chiefs to argue that syndication emerges from issuers' demand. They argue that there have been a number of issuers requesting syndicates.

Since the presence of information asymmetries turns underwriting into a market for external certification services, these facts deserve attention. In this regard, the industry has begun to distinguish between active and passive underwriters, whilst drawing attention to the risk of avoiding underwriting responsibilities in large syndicates. Thus, the role of banking relationships across markets as well as the effect of these relationships on the inner functioning of a syndicate have become relevant features of debt markets in recent years.

The existing literature has examined the effects of underwriting syndication on issuers and investors, highlighting the benefits – in terms of distribution, risks and visibility – of syndicate-placed deals (Corwin & Schultz, 2005; Huang & Zhang, 2011; Lee, Nasser & Via, 2015; Kim & Shin, 2012), as well as their potential risks, including a relaxation in screening and certifying functions (Shivdasani & Song, 2011). In addition, some recent studies have suggested a change in the structure of investment banking relationships (Corwin & Stegemoller, 2014; Morrison, Schenone, Thegeya & Wilhelm, 2014),

[2] Extracted from the Financial Times Stothard, M. (21 February 2013). Big banks' share of corporate debt at new low. www.ft.com/markets

[3] The term "bookrunner" is also employed, because the method typically used in debt placement is "at best efforts". However, expressions like "lead underwriter" and "underwriter" continue to be used indistinctly. In this paper, we will use the term "underwriting" to refer to the placement procedure for comparative purposes, due to its extensive usage in the industry and the literature.

whereby the current model is of less exclusive relationships with large numbers of connections. These changes in the industry have occurred as commercial banks have entered into the debt underwriting business in recent years, taking advantage of the relationships and experience accumulated in lending markets (Ang & Zhang, 2004; Gande, Puri, Saunders, & Walter, 1997; Shivdasani & Song, 2011; Yasuda, 2005). This entry has been more difficult in the case of equity underwriting, as information asymmetries may affect equity markets more than debt markets, and also because entry into the equity-underwriting business is primarily achieved through acquisitions by investment banks (Chaplinsky & Erwin, 2009). Furthermore, reputation plays a role in syndication, since due to the presence of information asymmetries, reputable banks act as certifiers when they underwrite an issue (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994).

Despite these market trends, empirical evidence in this domain is still rather scarce. Certain important phenomena remain unaddressed: for example, why the average underwriter's syndicate size continues to increase over time, how these syndicates are structured, the role that an underwriter's reputation plays within the syndicates, and the related pricing effects. Our analysis aims at contributing to the extant literature on issuer-underwriter matching by explaining how non-financial issuers' relationships with underwriting banks influence the decision of whether to syndicate the issuance or remain with a sole underwriter. We also examine how these relationships affect the structure of the syndicate. Additionally, the paper explores the effect of the concentration of these relationships on underwriting choice before and during the crisis. Regarding syndicate structure, this study provides evidence on how underwriters' reputational concerns in debt markets may drive syndicate formation.

This paper relies on a sample of 1,887 corporate bonds issued in Europe between 2003 and 2013. European companies' greater dependence on the bank lending market compared with U.S. firms is likely to be more reflective of the effects of bank-firm lending relationships on underwriting syndication. The research period allows us to control for the effects on underwriting syndication of bank-firm lending

relationships before and during the crisis. Our unique database contains detailed information about bond issuers, syndicates and issuer-underwriter lending relationships.

The empirical strategy comprises several stages. First, we employ probit models to explain the choice of a syndicate and the likelihood of being appointed as underwriter. Following Sufi (2007), the issuer-underwriter matching model contains one observation for every potential underwriter of each bond, thereby allowing multiple choices and correlations across all the eligible underwriters in a specific deal. We then use a count data model to explore syndicate size. We also employ an additional probit model to examine the determinants of the syndicate structure, treating each underwriter in a syndicate deal as a different observation. Syndicate formation is examined from the perspective of the underwriter, thereby providing a clearer understanding of the role that factors such as underwriter reputation and/or former issuer-underwriter relationships may have on syndicate formation. Finally, we use a Heckman selectivity model that accounts for self-selection to investigate the impact of syndicate choice on bond pricing.

By way of preview, the results suggest that prior relationships play a role in syndication choice. This is especially true during the crisis, as has been argued by the industry. Furthermore, the strength of the relationship is also relevant. Firms that have strong relationships with their lenders are more likely to use a syndicate to issue their bonds, in particular during the crisis years. We also find that reputational concerns affect syndicate formation, as more reputable underwriters are less likely to join a syndicate if their potential syndicate partners are less reputable. Finally, we find that the factors that favor the syndication choice (bank relationships, reputation) also have a negative effect on bond spreads.

The remainder of the paper is organized as follows. Section II reviews the related literature. Section III describes the dataset. The hypotheses and the methodology employed are explained in section IV. Section V discusses the main empirical results, while section VI offers robustness checks. Section VII concludes.

2. RELATED LITERATURE

Despite the recent evolution of multiple underwritten bonds, a sizeable and growing body of literature has studied this phenomenon in equity and debt markets. The main determinants of multiple underwritten initial public offerings (IPOs) have been examined in a seminal paper by Hu and Ritter (2007). Using a bargaining model, they predict that underwriters agree to jointly run an IPO when the issue size is large enough to ensure that the transaction is profitable (the "size hypothesis"). Empirically, they find that the increasing proportion of this kind of IPO is explained by larger issuances, the significant reduction of IPOs after 2000, a decrease in the importance of all-star analyst coverage and the increased number of buyout-backed IPOs. Jeon, Lee, Nasser and Via (2015) examine how these IPOs are related to firm visibility, concluding that greater visibility is achieved by going public with multiple lead underwriters. Furthermore, they find that IPO size is the main determinant for choosing more than one underwriter. Corwin and Schultz (2005) examine the role of IPO syndicates, concluding that both the number of underwriters and the number of co-managers increase with the deal's proceeds, while venture-backed firms are associated with more co-managers. Consistent with the size hypothesis, Gunay and Ursel (2015) and Shivdasani and Song (2011) find that larger issues are more likely to have more underwriters. They find firms that have previously appointed a commercial bank as co-manager and that belong to industries with a deep bank penetration are more likely to employ a syndicate. Jo, Kim and Shin (2012) find that firms that are inefficient in terms of corporate governance are associated with large SEO syndicates. In particular, they argue that the aim of reducing information asymmetries is what justifies hiring a large number of underwriters. In this sense, some of the extant studies relate the size hypothesis to "risk-sharing", suggesting that increased offering size is related to more risk. However, other studies, such as Corwin and Schultz (2005), do not find evidence of riskier offers being handled by larger syndicates.

As for the effect of a syndicate's formation on its functions[4], Pichler and Wilhelm (2001) propose a syndicate theory relating the organizational form of a syndicate to moral hazard.[5] They argue that the syndicate's organizational structure is a consequence of the central role of relationships and reputation, whereby the structure serves to alleviate the moral hazard problem. Relationships between banks are critical in syndicate formation, because they help to mitigate free-riding and moral hazard problems (Corwin & Schultz, 2005). Therefore, the underwriters' certification role is enhanced through syndication. However, contrary to the certification hypothesis, in a highly competitive context Shivdasani and Song (2011) find that syndicated deals are more likely to experience financial misconduct, as evidenced by shareholder litigation and earnings restatements after the offering. They argue that these findings are consistent with a relaxation in the deals' screening and certifying functions in the context of the entry of commercial banks into the business.

In addition, it seems that syndication may be affected by the prior relationships and historical and social performances that influence a syndicate's formation. Chung, Singh and Lee (2000) explore syndicate formation in the U.S. investment banking industry and conclude that banks are likely to form a syndicate with other banks that are able to complement their weaknesses. However, they also suggest that "status similarity" amongst the syndicate members is a fundamental determinant of the syndicate setting when market conditions are uncertain. Based on the Canadian investment banking industry, Baum, Rowley, Shipilov and Chuang (2005) show that banks performing above and below their historical and social aspirations are more likely to engage in new ties, while those performing closer to their aspiration levels prefer replicating prior relationships. Chuluun (2015) finds that the network connections – centrality, cohesion, experience and reciprocity – within the syndicate banks affect the fluxes of information and the division of the effort shared among the underwriters. The competition in the

[4] A range of studies has analyzed syndicate formation from the perspective of and based on the role played by co-managers (Chen & Ritter, 2000; Davidson, Xie & Xu, 2006; Jeon & Ligon, 2011; Ljungqvist, Marston & Wilhelm, 2009; Rajesh P. Narayanan, Rangan & Rangan, 2004; Popescu & Xu, 2011).

[5] Research studies have examined syndication in the lending market (Francois & Missonier-Piera, 2007; Gatti, Kleimeier, Megginson & Steffanoni, 2013; Godlewski, 2010; Lee & Mullineaux, 2004; Panyagometh & Roberts, 2010; Sufi, 2007).

investment industry structure and investment banks' networking relationships also seem to affect syndicate composition. Asker and Ljungqvist (2010) argue that the existence of fluxes of information between issuers and banks during the underwriting process makes firms prefer to avoid sharing banks with direct product market rivals, while Huang, Shangguan and Zhang (2008) show that investment banks' networking with investors has implications on a firm's decision whether to employ an investment bank.

As far as the issuer-underwriter matching perspective is concerned, a number of studies have found that not only reputation but also the existence of previous lending relationships positively affects the likelihood of being chosen as an underwriter (Bharath et al., 2007; Drucker and Puri, 2005; Duarte-Silva, 2010; G. Kanatas and Qi, 1998; Ljungqvist, Marston and Wilhelm, 2006). The general conclusion is that banks with closer relationships with issuing firms are less likely to be excluded in a subsequent offering. These studies also show how firms' relationships carry over across different transaction types such as lending, underwriting, and mergers and acquisitions. However, most of these studies suggest that although lending relationships affect the choice of an underwriter, the opposite is not true. Chen, Ho and Weng (2013) find that banks that underwrite a firm's IPO are more likely to provide the issuer with future loans. As relationships are determinants of underwriting matching and syndication choice from a relational perspective, these studies relate to the strand of literature focused on the nature of investment banking relationships (Corwin & Stegemoller, 2014; Morrison et al., 2014).

There is little evidence in the literature indicating whether syndicate size comes at a cost for the issuer. In a recent paper, Levis, Meoli and Migliorati (2014) find that syndicate size had no effect on the underwriting fees charged in UK SEOs during the financial crisis. Peristiani and Santos (2010) analyze the gross spread evolution in the U.S. and Eurobond markets. They find a statistically significant negative effect of the number of underwriters on Eurobond market fees from 1995–2006. In the most specific study on this issue, Shivdasani and Song (2011) do not find differences in bond pricing between sole and syndicated deals.

Our paper offers a threefold contribution. Firstly, to the best of our knowledge, this is the first empirical study that examines the influence on syndicate formation of both issuers' previous relationships with underwriting banks and underwriters' reputational concerns. Secondly, we find that the concentration of these relationships had differing effects on underwriting choice before and during the crisis. Finally, we find that during the crisis, due to the inverse relationship between those factors that favor syndication choice and at-issue bond yield spreads, issuers self-selected into a sole or syndicated deal and this self-selection led to lower spreads.

3. DATA AND DESCRIPTIVE STATISTICS

Our primary data source for non-financial corporate bonds issued in Europe from January 1, 2003 to January 1, 2014 is the Dealogic Debt Capital Markets database. This database provides detailed information about bond characteristics, including syndicate formation. The sample comprises fixed non-perpetual corporate bond issues, excluding those deals issued by utilities and regulated (SIC: 4000s) or financial firms (SIC: 6000s) as well as deals that do not report information about the underwriter parent and issue rating at launch for at least one tranche. The sample period covers the pre-crisis and crisis years.

Firstly, in order to control for issuer characteristics, we match the Dealogic dataset to the main accounting information provided about the issuer by Compustat Global. In order to determine the existence of relationships between issuers and underwriters, we also match each bond issuer with its lending information provided by Thomson ONE.[6] This provides a unique sample with detailed information about bond characteristics, issuer characteristics and lending relationships. In order to identify issuer-bank relationships, we account for mergers and acquisitions (M&As) between underwriters during the sample period. We collect information on M&A activity from Thomson ONE, LexisNexis and banks' own information sources.[7] Information regarding the database's construction and

[6] Issuers' identification indicators provided by Dealogic are used to match both databases.

[7] We identify prior lending and underwriting relationships accounting for mergers between underwriters. For example, in Bank of America's acquisition of Merrill Lynch on January 1, 2009, we use different codes for the acquired bank and the acquirer before the acquisition. As of the acquisition date, the resulting entity Bank of America Merrill Lynch absorbs all relationships from both predecessor banks. For

some summary statistics for the sample distinguishing between bond, issuer and syndicate features are offered in Table I. In our framework, the crisis period extends from September 2008 to December 2013. This extended crisis period, compared to the U.S. crisis period, serves to account for the interbank liquidity crunch and the firm credit crunch in Europe. Furthermore, in terms of quarter-on-quarter changes in seasonally adjusted real GDP, the recession ends for Europe in 2013. Our final sample includes 1,505 deals – structured in 1,887 tranches – by 345 unique issuer parents involving 90 underwriters largely representing the European corporate bond markets.[8]

Table I also reports the yearly distribution of the sample by number of underwriters. Our sample results confirm the increase in the number of underwriters previously reported.[9] The so-called "multiple underwriting" trend is observed. In 2003, the average number of lead underwriters by tranche was 2.5, while in 2013 it was close to 4. During the period 2003–2005, around 20% of corporate bonds were placed by one lead underwriter, while in 2013 this average was close to 10%.

Together with the multiple underwriting phenomenon, prior studies have reported an increase in firms' number of relationships. While in the past firms mainly had a relationship with one bank, today relationships are less exclusive, as firms hold relationships with several banks (Corwin & Stegemoller, 2014). Figure A.I shows that firms have increased the number of relationships they hold in the underwriting industry over time. While in 2003 an average issuer had ties with 2 different banks considering a three-year window, the number of different ties rose to 3.5 in 2013. Regarding the strength of these relationships, Figure A.II reveals that currently firms' relationships are less concentrated on a few underwriters.

4. HYPOTHESES AND METHODOLOGY

exemplification purposes, in the Appendix we report the lifetime of two banks that were involved in M&As: Credit Agricole CIB and Commerzbank.

[8] The geographical distribution of the deals is as follows: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Poland, Portugal, Spain, Sweden and the United Kingdom.

[9] Dealogic reports that "*before 2000 the average number of underwriters was close to one*". Furthermore, Thomson Reuters has recently reported that "*in 2000, 89% of European initial public offerings involved a sole bookrunner and the maximum number on any deal was five. This year just 44% involved a single bookrunner and the maximum number on any deal was fifteen*".

4.1 The effects of firms' relationships

4.1.1 The impact of firms' relationships on the syndication decision

Previous studies argue that issuers' relationships affect the probability of choosing a bank as underwriter (Bharath et al., 2007; Drucker & Puri, 2005; Duarte-Silva, 2010; Gande, Puri & Saunders, 1999; Ljungqvist, Marston & Wilhelm, 2006; Rajesh P. Narayanan, Rangan & Rangan, 2004; Yasuda, 2007). However, there is no evidence regarding how these relationships might influence the decision to syndicate the issuance or remain with a sole underwriter; nor is there evidence of their effect on the structure of the syndicate formation. Throughout their existence, firms hold relationships with banks, even though these relationships may be more or less concentrated. Acknowledging the larger probability of firms choosing underwriters with which they have prior relationships, as the literature on matching argues, an issuer's decision to syndicate is likely to be influenced by the existence of these relationships. Our baseline hypothesis is defined as follows:

H1: *Prior bank-firm relationships affect the decision of whether to syndicate a bond issuance*

A first methodological reference to empirically explore the choice of a single versus multiple underwriter(s) consists of estimating a discrete choice model in which the likelihood of issuing a syndicate-placed bond (rather than a single-underwriter bond) is explained by deal, issuer and syndicate characteristics (Corwin & Schultz, 2005; Hu & Ritter, 2007; Jeon et al., 2015; Shivdasani & Song, 2011; Song, 2004):

$$\mathrm{E}(\text{Multiple Underwritten Deal} \mid \mathrm{X} = \mathrm{x}) = \Lambda\,(\beta_0 + \beta_1 X_{bond\ features} + \beta_2 X_{issuer\ features} + \beta_3 X_{syndicate\ features} + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + \sum_{m=1}^{m} Industry_m + e_i\,) \qquad (1)$$

in which $X_{bond\ features}$ is a vector of variables containing characteristics of the bond, $X_{issuer\ features}$ is a vector of variables reflecting the issuer's features, and $X_{syndicate\ features}$ is a vector of variables accounting for the characteristics of the syndicate. We include year and country dummies in all our regressions in order to control for variations in debt financing over time and the nationality of the bond,

respectively. Since in our model the dependent variable is binary, we employ a probit model to estimate the likelihood of issuing a multiple underwritten bond.

Bond characteristics are particularly important in explaining syndicate size. Most previous studies agree that distribution capability in security underwriting increases as the number of underwriters in a syndicate increases. Financial intermediaries develop extensive networks with investors in the course of their continuous interactions in capital markets[10]; therefore, adding more underwriters ensures an expansion of the base of potential investors. Because syndication strengthens distribution capabilities, it is expected that deals that entail more placement complexity will be underwritten by several banks. In this sense, the complexity of the marketing, pricing and selling activities increases with the size of the offering. *Bond maturity* is also included in the equation to capture how the relationship between maturity and risk affects the syndication choice. A dummy for callable bonds is also incorporated. Furthermore, we have included *bond rating*[11] to test the impact of bond quality on the choice of single- versus syndicate-underwritten deals. It may be the case that issuers employ syndicates to place low-rated bonds because a sole bank would decline to bear all the risk of such a deal. Conversely, Shivdasani and Song (2011) argue that if low-quality issuers need stronger certification, they choose a sole underwriter, which would support a deterioration in the certification function in syndicated deals.

Regarding issuer characteristics, we include *firm size*, firm *leverage* and firm *profitability (ROA).*[12] We also account for issuer experience in the capital markets, including the dummy *first-time issuer*. In addition, many corporate bonds are issued by a *finance vehicle*, a company in charge of issuing capital market instruments in the financial markets on behalf of their parent. We control for this fact, not previously considered in the literature, since finance vehicles' specialization in issuing debt instruments

[10] In this sense, (Chemmanur & Krishnan, 2012; J. M. Griffin, Harris, & Topaloglu, 2007; Jenkinson & Jones, 2007; Neupane & Thapa, 2013) provide empirical evidence regarding underwriter-investor relationships. Furthermore, more reputable underwriters have stronger relationships with institutional investors and a more extensive investor base.

[11]Bond credit ratings represent the creditworthiness of corporate bonds. When rating agencies provide a rating, they also assess the creditworthiness of the issuer. Together with *bond rating*, we have also included *issuer rating*, but in separate regressions to avoid multicollinearity problems. For the sake of brevity, we report results of the regressions including *bond rating* as regressor. The results where *issuer rating* is considered are not reported, but they are qualitatively similar. All results are available upon request.

[12] All the accounting values were collected at the end of the year before the issuance.

the might affect syndicate formation. These firms' own specialization may lead them to require a smaller number of underwriters. As prior studies suggest that underwriters may have been replaced by adding extra co-managers, we include *number of co-managers* as an explanatory variable. Furthermore, we control for *underwriter reputation*, proxied by the average market share of the underwriter,[13] since a number of studies have agreed that reputation is determinant in the matching (Benveniste et al., 2003; Drucker and Puri, 2005; Hoberg, 2007; Kanatas and Qi, 2003; Yasuda, 2007; Fernando et al,. 2015; Fernando et al., 2012). Consistent with extant studies (Bharath et al., 2007; Duarte-Silva, 2010; G. Kanatas and Qi, 1998; Ljungqvist, Marston and Wilhelm, 2006), prior ties with an underwriter affect current underwriter choice. The timing of the issue is also considered with the inclusion of *market simultaneity*. This variable captures whether there was a high volume of offerings in the European capital markets at the issue date. In this regard, Gunay and Ursel (2015) argue that during periods in which offerings are highly concentrated, a relationship with an underwriter helps the issuer to ensure access to underwriting services.

Finally, as we are interested in how prior firm-issuer relationships drive the choice between single versus multiple underwriters, the three main roles of the underwriting bank – as bond underwriter, lender or co-manager – are considered. We account for prior relationships, controlling whether the current underwriter was previously appointed as bond underwriter and co-manager, or if there were prior lending ties. Furthermore, since studies on the effects of cross-market relationships have documented the relevance of previous and concurrent lending relationships as determinants of matching, we include a variable that controls for prior lending relationships between the issuer and the underwriter. Table A.I in the appendix lists and defines all variables used in our analyses.

Another central issue is that not just the mere existence of previous relationships but the strength of these relationships seems to be relevant in the syndication choice. As discussed above, having an

[13] Market shares are collected from the Annual League Tables provided by Dealogic. In multiple underwritten deals, proceeds are equally apportioned among the underwriters.

exclusive relationship with a single bank or, conversely, with several banks, is likely to affect the decision whether to syndicate or not.

Initially, based on the desire to avoid informational spread among syndicate underwriters (Asker & Ljungqvist, 2010) and a potential low certification effort as syndicate size increases (free-riding problems), we argue that it could be expected that firms with strong relationships are less likely to employ a syndicate if they perceive that having exclusive relationships is more beneficial.[14] Moreover, establishing a new banking relationship is initially costly (Boot, 2000), so these firms would not consider this alternative if they did not foresee any hold-up problems. In contrast, firms with extensive relationships would be more prone to employ a syndicate as a way of continuing to enjoy the benefits of diversification associated with the use of multiple banks.

However, the recent financial crisis may help to explain a switch in syndication choice for firms that were highly dependent on single-bank relationships. The literature on relationship banking shows that firms switch from single to multiple relationships when they are concerned about hold-up costs (Farinha & Santos, 2002). In this regard, Gopalan, Udell and Yerramilli (2011) suggest that firms form new banking relationships to expand their access to credit and capital market services. Relationships seem to be valuable during a financial crisis, since being engaged in a multi-banking relationship may also allow firms to withstand potential shocks more easily (Bolton, Freixas, & Gambacorta, 2016; Carvalho, Ferreira, & Matos, 2015; Sette & Gobbi, 2015). The climate of uncertainty and credit contraction is likely to awaken interest in reducing their single-bank dependence. Furthermore, there is evidence that during the crisis single-bank firms were substantially more credit-constrained than firms with multi-bank relationships (Cahn, Duquerroy, & Mullins, 2017).

The financial crisis may have accentuated firms' perceptions of the risks of hold-up problems associated with exclusive relationships. This would be in line with Gopalan et al.'s (2011) findings on

[14] Similarly, Bennouri, Falconieri and Kooli (2015) find that firms that go public with multiple-bank relationships exhibit more underpricing than those with single-bank relationships.

access to credit and capital market services. Engaging in a multi-bank relationship may also mitigate firms' hold-up problems (Detragiache, Garella, & Guiso, 2000; Rajan, 1992; Sharpe, 1990; von Thadden, 2004). In this sense, we expect that firms' perception that a banking and financial crisis exposes them to credit restrictions is likely to affect the syndication decision. For example, during the crisis, firms that hold exclusive relationships with banks are less likely to employ a sole underwriter.

This fundamental issue relating to the strength of firms' relationships and the impact of the crisis on the choice of sole versus syndicated deals is formulated as follows:

H2: *Firms that hold exclusive (concentrated and not diversified) banking relationships are less likely to employ a syndicate if they do not perceive a risk of facing hold-up problems.*

It is important to note that although we test this hypothesis, we do not explore the role of bank-firm relationships in underwriting choice, which according to the literature increases the likelihood of choosing a syndicate. What we examine is how the concentration of these relationships affects underwriting choice before and during the crisis.

Thus, we have used a measure of firm-bank's relationship strength – a *relational Herfindahl Index* – as in Carvalho et al. (2015) and Gobbi and Sette (2014). This index is built for each issuer at the time of issue. In doing so, we track all the loans granted to each issuer in the two years prior to the bond issuance. Finally, we take the sum of the squared shares of loans granted to the firm held by each bank[15] to obtain the relational Herfindahl index. A large value indicates that the issuer has highly concentrated lending relationships. The crisis effect is considered by interacting our variable of relationship strength with a crisis dummy variable that takes the value 1 for issues occurring between September 2008 and December 2013.

[15] Using measures of bank relationship strength based on prior bond issuances would not be appropriate. This is firstly because this way of proceeding would introduce endogeneity in our model, since prior syndication choices will affect the Herfindhal index considered in later bond issuances; and secondly because lending restrictions during the crisis are what accentuated the risk of hold-up problems.

Finally, although we control for a set of bond and issuer features, it is important to ensure that the changes in syndication behavior are not driven by fundamental changes in issuance in the European corporate bond markets. We conduct a matched sample analysis for bonds issued in the pre-crisis and crisis periods. The matching is based on the characteristics of the bonds, i.e. size, maturity, rating class and callability; and the issuers, i.e. size, leverage and profitability. In this process, we employ different matching algorithms, such as propensity score and nearest-neighbor.[16] After obtaining the matched sample of bonds based on the abovementioned characteristics, we re-run the baseline models on syndication choice to examine the impact of firms' relationships. Consequently, we ensure that the results obtained are not explained by fundamental changes in issuance in the corporate bond markets.

4.1.2. The impact of firms' relationships on matching during the crisis

Which banks are more likely to underwrite a debt offering? We explore the role of bank-firm relationships on a bank's likelihood of being chosen as an underwriter over time. Although these relationships increase the likelihood of being chosen (Bharath et al., 2007; Drucker and Puri, 2005; Duarte-Silva, 2010; Ljungqvist, Marston and Wilhelm, 2006), their impact on the choice made may differ over time. Regarding credit supply, there is evidence of stronger effects of relationship lending when firms are exposed to financial uncertainty and difficulties (Sette & Gobbi, 2015). Prior studies have also shown that relationships were valuable during the recent financial turmoil.[17] Moreover, since the crisis emerged, the investment banking industry has argued that a reward mechanism that was put into practice might explain the multiple underwriting phenomenon. Some investment bank chiefs report that, during the financial crisis, banks with which firms had a lending relationship were more likely than before to be appointed as underwriter. A chief investment banker reported to the Financial Times: "*There may be, say, 12 joint bookrunners on a large M&A deal, but only a subset of those will be active, effectively*

[16] The matching incorporates the so-called "common support condition" of dropping treatment observations whose propensity score is higher than the maximum or lower than the minimum propensity score of the controls.
[17] See among others Alexandre, Bouaiss and Refait-Alexandre (2014), Dewally and Shao (2014), and Kahle and Stulz (2013).

rewarding relationships without compromising the execution of the transaction."[18]. This way of proceeding would have led firms to respond to the reward gesture, including the lending bank as bond underwriter because it *"is an easy and also very visible way of rewarding them*". This implies that lending to a firm during a banking crisis, in which there are credit constraints, is valuable for the bank because it leads to future underwriting mandates being won. This leads us to explore our hypothesis regarding the effects of firms' relationships on syndication decisions before and during the financial crisis.

In order to address this issue, we build a model of the decision to choose a bank as bond underwriter from a set of potential underwriters. The choice set includes all banks with at least one bond underwritten in the year of the bond issuance.

$$\mathrm{E(Y\,|X=x)} = \Pr(Chosen\ UW = 1|\,\mathrm{X}) = \Lambda\,(\beta_0 + \beta_1 X_{bond\ features} + \beta_2 X_{issuer\ features} + \beta_3 X_{syndicate\ features} + \beta_4 X_{underwriter\ features} + \beta_5 X_{issuer-underwriter\ relationships} + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + \sum_{m=1}^{m} Industry_m + e_i\,) \qquad (2)$$

We use a probit model to examine the issuer-underwriter matching probability, accounting for bond, issuer, syndicate and underwriter features. Our dependent variable is a dummy taking the value 1 if the bank is chosen among the set of potential underwriters. We use a probit rather than a conditional probit model because more than one underwriter per bond can be chosen. Using a conditional probit model, an extension of the multinomial logit model, would mean assuming that choice probabilities satisfy an independence of irrelevant alternatives (or IIA) property. This is an assumption that could not be maintained in our data, since two underwriters could present similar characteristics, with their errors being correlated. This could be solved using a nested model if the dataset consisted only of sole underwritten deals in which each issuer chose just one underwriter, which is not the case in this study. Using as a starting point Amemiya (1974), who considers that the preferred technique in a situation like ours is to estimate a probit model, we follow Corwin and Schultz (2005) and Sufi (2007) and employ a

[18] Extracted from the Financial Times (Gavin Jackson, 17 June 2015) Banks prosper from euro company debt rush. www.ft.com/markets

probit model to determine the likelihood that specific underwriters are included in a syndicate. We include one observation for every potential underwriter for each bond after accounting for all the M&As during our research period. In estimating the probit model, as Sufi (2007) highlights, if an underwriter is chosen on a deal it may affect whether another underwriter is chosen on the same deal. We therefore allow for correlation across all the eligible underwriters on a specific deal.

We employ three variables that capture the existence and strength of previous lending relationships between the issuer and each bank in the set of eligible underwriters. First, we employ *lender mkt. share,* which is the proportion of the issuer's total loan proceeds for which the underwriting bank was appointed as lead manager. These market shares are computed by splitting the loan value equally between all lead managers in multiple syndicated loans. We then use a discrete variable named *prior lender* which takes the value 1 if the underwriting bank has acted as lead manager in a previous loan of the issuer. Subsequently, our measure *max. relationship lende*r captures the strength of the issuer-underwriter relationship. This is a dummy variable, taking the value 1 if the underwriter for the issuer is the bank with the largest lender market share. If the largest market share value is held by more than one underwriter, then neither of them is considered the *max. relationship lende*r, and the dummy takes the value zero. In our analysis, we examine these relationships over a two-year window before the issuance date, consistent with related studies on prior relationships (Sufi, 2004)[19]. For robustness purposes, in order to more accurately capture the effect of closer lending relationships in the crisis scenario, we subsequently consider a one-year window.

Furthermore, as previous underwriting (UW) relationships also affect underwriting choice, we include *UW mkt. share, prior UW* and *max. relationship UW*. We expect the effects of these variables to be positive and statistically significant.

[19] A large time window would bias our results, as the effects of recent lending relationships could vanish over time. Furthermore, the changing nature of investment banking relationships, where in more recent years firms have held new, more diversified and less exclusive relationships (Corwin & Stegemoller, 2014), does not suggest using a larger time window.

Furthermore, in order to better assess the effect of the reward mechanism, we have also included two variables that reflect whether a bank is chosen in subsequent offerings. If there is a reward mechanism, as is suggested in the industry, being the latest lender (*UW latest lender*) or bond underwriter (*UW latest bond UW*) in the issuance would greatly increase the probability of being chosen. In addition, the reward effect would be larger if the latest loan has been granted recently. We control for this fact with a variable that measures the time elapsed since the latest loan (*Time latest loan*). According to the proposed reward behavior, the more recently the loan was granted, the larger the likelihood of being chosen would be. We also explore this reward behavior from the perspective of whether the firm is a recent borrower (i.e. whether the firm took out a loan the year before the bond issuance). A priori, we would expect that even though the effects of lending relationships would be present for both kinds of firms, these effects would be larger for recent borrowers.

In addition to this, and consistent with prior literature, we control for others factors likely to affect the matching. Reputation attracts business, which is why we expect a positive and significant coefficient for *underwriter reputation*, which is constructed using the market shares of apportioned proceeds.[20] Furthermore, as geographical proximity[21] also affects the matching between the issuer and the underwriter, we consider whether they are both located in the same country (*shared nationality).* In addition, underwriter industry specialization is likely to generate information spillovers if there is a concentration of issuance in an industry over a short period (Booth & Chua, 1996). This specialization is likely to affect the prospect of being chosen as underwriter in future issuances. We account for this factor by including a measure of *underwriter industry specialization*.[22] Finally, the impact of the crisis

[20] In unreported regressions, we employ two different discrete measures of UW reputation (UW Top 5 and UW Top 7) to control for the oligopolistic structure of the underwriter industry due to the presence of the traditional bulge-bracket investment banks. Results are qualitatively similar.

[21] Corwin and Schultz (2005) show that underwriters located closer to the issuer (in the same U.S state) are more likely to be included in the IPO syndicate, while Sufi (2007), focusing on the syndicate loan market, reveals that being in the same region as the firm increases the probability of an underwriter being chosen as a participant by 6.7%.

[22] *Underwriter industry specialization* is measured using a Herfindhal index. This index is calculated for each underwriter as $\sum_{i=1}^{n}\left(\frac{g_i}{G}\right)^2 . g_i$ is the gross proceeds issued by the underwriter in the 2-digit SIC-industry i and G is the total gross proceeds issued by the underwriter.

on underwriter choice is captured in the interaction of the main explanatory variables with the crisis dummy.

4.1.3. The impact of firms' relationships: A reward mechanism or an informational asymmetries problem?

As mentioned above, according to the industry, a reward mechanism led to the favoring of prior relationships. However, during a financial crisis, the information asymmetry problem is likely to worsen. Larger informational asymmetries may affect the matching between firms and underwriters. It is therefore relevant to distinguish the impact of information asymmetries from that of a reward mechanism. Some studies have conducted a counterfactual analysis estimating the probability that a bank would be chosen as underwriter in a low versus a high informational asymmetry scenario, excluding the reward behavior. This kind of methodology has been used in financial intermediation (Schroth, Suarez, & Taylor, 2014), bank regulation (Carbó-Valverde, Humphrey, & Rodríguez-Fernández, 2003; Lopez & Spiegel, 2014), CDS issuance (Beirne & Fratzscher, 2013; Danis & Gamba, 2017) and bank concentration (Pérez Montes, 2014).

We compute the probability of being chosen as underwriter during the crisis using the estimated coefficients from the pre-crisis period (a period with no rewarding behavior). In doing so, we obtain the predicted probability in a scenario with high information asymmetries but without a reward mechanism (*Lenders' Pred. Probability* $_{High\ Asymmetries\ –\ No\ Rewarding}$). In addition, we also compute the probability during the pre-crisis period using the estimated coefficients from the crisis period (which incorporates a reward mechanism) to obtain the Lender's Pred. Probability $_{\text{Low Asymmetries – Rewarding}}$. If the rewarding behavior holds, the predicted probability for a lender should be always larger in the presence of the reward mechanism – regardless of whether it is a low or high informational asymmetry scenario – compared to a non-rewarding case. Moreover, following an approach analogous to those studies on productivity that

use an index to distinguish between two effects,[23] we use a geometric mean as the Malmquist index to separate differences into rewarding behavior and informational asymmetries effects. Figure II summarizes the identification strategy.

4.2 Syndicate formation: Determinants of syndicate size

This section examines how syndicates are established and how reputation can affect syndicate formation. First, we examine the main determinants and features of syndicate size. As before, the empirical strategy for addressing this question consists of estimating a model capable of explaining syndicate size whilst controlling for deal, issuer and syndicate characteristics.

$$\mathrm{E}(\text{Nº of Underwriters} \mid \mathrm{X} = \mathrm{x}) = \Lambda\,(\beta_0 + \beta_1 X_{bond\ features} + \beta_2 X_{issuer\ features} + \beta_3 X_{syndicate\ features} + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + \sum_{m=1}^{m} Industry_m + e_i\,) \quad (3)$$

The dependent variable is the number of banks appointed as underwriters on a deal. It takes integers from 1 to 16, the largest underwriter syndicate in our sample. A zero-truncated Poisson model designed for count data, in which the dependent variable is a non-zero positive value, is employed. Instead of using a Poisson or negative binomial model, a zero-truncated Poisson model is preferred because the Poisson and the negative binomial models are fit by including probabilities for zero values, even though there are no zero values in our data. Moreover, a zero-truncated negative binomial model would be desirable if there was over-dispersion in our data in addition to zero truncation, which is not the case. Because the theory suggests that issuers could be in a sole underwritten deal regime or in an underwriting syndication, a two-stage estimation methodology is also employed.[24] In the first stage, we use a probit model in which the dependent variable takes the value 1 if the bond is a syndicated deal; while in the second stage we estimate syndicate size in multiple syndicated bonds using an ordinary least squares (OLS) method including the inverse Mills ratio to correct for self-selection bias.

[23] See Fare, Grosskopf, and Norris (1994).
[24] Detragiache, Garella and Guiso (2000) employ a similar two-stage estimation strategy to examine the optimal number of banking relationships that a bank employs.

4.3 What determines whether a bank joins an underwriting syndicate?

We then investigate the syndicate setting from the perspective of the underwriter. Most previous studies have examined the determinants of multiple underwritten deals from the issuer level or in relation to bond characteristics, while there is little information regarding the underwriter's perspective.

Studies that have examined the determinants of multiple underwritten deals by using a bond-level analysis provide insights into how issuer-underwriter relationships affect the matching, but they tend to omit the underwriters' perspective.[25] Corwin and Schultz (2005)[26] and Tunick (2004)[27] report, based on conversations with investment bankers, that underwriters would always prefer to be the sole deal underwriter. They argue that including several underwriters is an issuer demand. From the underwriters' perspective, there are several reasons that motivate this preference. A first, primary reason is that a sole underwriter collects all the fees. Secondly, if they are not the sole underwriter, they are penalized when league tables are computed. In the case of syndication, the proceeds are shared between all the syndicate underwriters, even if the others were passive underwriters. This is not trivial, since there is evidence regarding the importance of published "league tables" in terms of reputation (Ang & Zhang, 2004; Golubov, Petmezas & Travlos, 2012; J. Griffin, Lowery & Saretto, 2014; Jeon et al., 2015). However, although a joint-underwriting appointment is tempting, as a joint role is better than being excluded, there are also some factors likely to restrain underwriters from entering a joint deal. Consequently, with this perspective, in this section we investigate the drivers"" that affect underwriters' decision to join a syndicate.

As discussed earlier, previous studies highlight underwriters' concerns regarding the maintenance of reputational status. Reputation is crucial for underwriters in capital markets. Reputable underwriters,

[25] Prior literature has recognized the importance of past and present relationships for firm-underwriter matching. Seminal papers about "relationship-specific capital" include James (1992) and Rajan (1992b). Empirical papers include (Burch, Nanda & Warther, 2005; Drucker & Puri, 2005; Rajesh P. Narayanan et al., 2004; Roten & Mullineaux, 2002; Schenone, 2004; Yasuda, 2005).
[26] Corwin and Schultz (2005): "*As one investment banker told us, 'if we're the lead [underwriter], the best number of co-managers is zero'*".
[27] Tunick (2004): "*Moreover, these bankers claim that it's issuers who are demanding the multiple bookrunners. 'It's the way the world is evolving, and it's what clients are demanding, so it's hard to be bitter toward an evolutionary trend that's being demanded by the marketplace,' says an equity banker . . . In the end, however, he says joint and multiple bookrunning is actually in the best interest of the issuer because it ensures the greatest distribution of its deals*".

as credible certifiers, are believed to reduce information asymmetries more efficiently (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994). It could be argued that more reputable banks would be less likely to accept the formation of a syndicate when it may put their reputation at risk. Nevertheless, as suggested by Shivdasani and Song (2011), the increased competition in the underwriting industry may have reduced the reputational concern, leading reputable banks to agree to enter into joint-underwriting deals despite assuming that their reputation may be jeopardized. An effect of reputation on syndicate formation is likely to be present. In line with an extensive and consolidated literature that argues in favor of the sound certification hypothesis, we hypothesize that highly reputable banks will not participate in a syndicated deal if their counterparts are less reputable. If this hypothesis is accepted, we argue that the underwriter's desire to avoid risking the deal's success and consequently their reputation is what motivates this action. Hence, the following certification (reputation) hypothesis would be confirmed:

H3: *Reputable banks are less likely to join a syndicated deal if their counterparts are less reputable underwriters.*

In our empirical approach, we treat each underwriter in a multiple underwritten deal as a different observation. This methodology allows us to examine the syndication determinants from the underwriters' perspective. Furthermore, we believe that this way of proceeding offers a better understanding of issuer-underwriter matching. Within the syndicate, we are able to disentangle the specific ties between underwriters and also between the issuer and each underwriter. In our specification, we include bonds and issuers' features and, in particular, underwriters' characteristics.

$$\text{E(Multiple Underwritten Deal } |\text{X} = \text{x}) = \Lambda\,(\beta_0 + \beta_1 X_{bond\ features} + \beta_2 X_{issuer\ features} + \beta_3 X_{underwriter\ features} + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + \sum_{m=1}^{m} Industry_m + e_i\,) \quad (4)$$

As part of our identification strategy, we include variables that measure underwriter reputation compared to average market standards (*Underwriter reputational distance*) and compared to their counterparts in the syndicate (*UW syndicated reputational ratio*). A large value for UW reputational

distance indicates that the underwriter is relatively more reputable than an average underwriter in the market,[28] while a UW syndicated reputational ratio larger than 1 means that the underwriter is relatively more reputable than other underwriters in the syndicated deal. In this sense, consistent with the certification hypothesis that reputable banks are highly concerned about maintaining their reputation, we expect that as the reputational gap increases, banks would be less likely to join a syndicate.

Additionally, the relative weight that the bond entails for each underwriter is considered on a monthly basis, computed as total bond proceeds placed by the underwriter in the deal versus total proceeds placed by the underwriter in the current month (*UW relative bond weight)*.[29] If this ratio is close to 1, it means the underwriter is putting all its current underwriting capacities into that specific bond. We expect this variable to have a negative coefficient. Firstly, due to capacity constraints, if an underwriter is placing many bonds simultaneously, it would be more prone to accept joint syndication. Secondly, if one bond receives all of an underwriter's attention, it is arguable that the bond would receive the underwriter's top expertise, so a joint syndication would be undesirable, as their efforts on behalf of the issuer would be less visible in a syndicate. Then, we include an adaptation of Hu and Ritter's (2007) *relative pipeline* – defined in the appendix – in order to measure how busy an underwriter is, given its reputation and market condition. A positive value means that underwriters are more likely to join a syndicate if they are working at their full capacity.

Finally, in order to examine this effect for highly reputable banks, we interact *UW Reputational distance* and *UW syndicated reputational ratio* with a dummy that takes the value 1 for the underwriters scoring in the Top 7 for reputability.[30]

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[28] As an alternative to *UW reputational distance*, we also consider another variable, *DistanceMS*, which measures the reputational distance but accounts for the bond size $DistanceMS_i = \frac{Mkt\ share_{i,t} - \overline{Mkt\ share_t}}{Standard\ Dev\ MS_t} - \frac{Bond\ Size - \overline{Bond\ Size_t}}{Standard\ Dev\ Size_t}$. Results are found to be robust.

[29] This measure is monthly because the underwriting process lasts approximately 4–5 weeks without including the market stabilization phase. However, we also considered other time windows in unreported regressions. After considering weekly and quarterly windows, results remain robust.

[30] We use the Top 7 UWs because they can be considered as highly reputable in the European context. In this sense, Dealogic reports that from 2003–2013, the Top 3 UWs in the corporate bond markets in the United States held a market share (37.37%) similar to the Top 7 in Europe (43.17%). However, for robustness purposes, we also employed a Top 5 dummy, and results are similar.

4.4 Does syndication come at a cost?

The third research question is whether syndication comes at a cost for issuers and investors. The positive relationship between firm visibility and syndicate-placed deals as well as the possibility of reaching a large number of investors are some of the benefits of syndication (Jeon et al., 2015). In this sense, as mentioned above, underwriting syndication can be considered as partially a response to issuers' demand. Similarly, as Shivdasani and Song (2011) argue, investors may also request larger spreads if the deals have reputation problems caused by low screening. However, we would like to establish whether, as Sufi (2004) finds, there is a trade-off between the potential benefits and the funding costs of choosing multiple underwritten deals. Furthermore, lending relationships as drivers of the syndication choice must be considered, since there is evidence of lower spreads due to commercial banks' entry into the underwriting industry (Kim, Palia, & Saunders, 2008).

If, as we expect, reputable banks are less likely to join a syndicate when their reputation might be at risk, we can conclude that syndicate formation is driven by underwriters' concerns regarding the maintenance of their reputational status. This reputational concern might relax as syndicate size increases, since large syndicates are on average less reputable. Furthermore, since the crisis emerged, the impact of lending relationships on underwriter choice seems to have become more relevant, as we have predicted. In this sense, the existence of biases due to issuers' self-selection into sole or syndicated deals is likely to be present in this period. In addition, if, as we predict, firms' lending relationships affect underwriting choice, we would expect to find this effect for syndicated bonds due to self-selection.

In order to address the effect of self-selection, we employ a Heckman (1979) model, as the choice of the syndicate structure is likely to be endogenous. We first estimate a probit model on the syndication choice, and we obtain the inverse Mills ratio. This ratio is then used as one of the regressors in the second-stage equation to produce consistent estimates. Our dependent variable in the second stage is the bond

spread at launch, which is the difference between the yields of the bond and a benchmark treasury bond expressed in basis points.

1st stage:

$$\Pr(\text{Syndicated Bond} = 1 \mid X = x) = \Lambda\,(\beta_0 + \beta_1 X_{bond\ features} + \beta_2 X_{issuer\ features} + \beta_3 X_{syndicate\ features} + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + \sum_{m=1}^{m} Industry_m + e_i) \quad (5)$$

2nd stage:

$$\text{Bond Spread (bps)} = \beta_0 + \beta_1 X_{bond\ features} + \beta_2 X_{issuer\ features} + Inverse\ Mills\ Ratio + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + \sum_{m=1}^{m} Industry_m + e_i \quad (6)$$

5. RESULTS

5.1 The effects of firms' relationships

5.1.1. Determinants of the syndication decision

Table II offers some descriptive statistics comparing sole and multiple underwritten bonds. We test for differences in means (t-statistics) and in medians (Wilcoxon rank sum statistics) between the two groups in bond, issuer and syndicate characteristics. Consistent with earlier studies on multiple underwriting, bonds placed by more than one underwriter differ significantly from those placed by just one bank in several respects. In particular, multiple underwritten bonds appear to be large in size.[31] We also find that callable bonds with a longer maturity are more likely to have multiple underwriters. This is consistent with our expectations that long-term[32] and callable bonds are more complex to bring into market. It is also worth noting that domestic bonds are mostly placed by just one underwriter, while international bonds tend to be placed by a syndicate. As international bonds are mainly oriented to large investors, hiring more underwriters in order to reach a greater base of potential investors seems to make

[31] Shivdasani and Song (2011) and Jeon, Lee, Nasser and Via (2015) obtain similar results for issue size, also using mean- and median-difference tests for corporate bonds and IPOs, respectively.
[32] Shivdasani and Song (2011) also find that bonds with a longer maturity are more likely to be placed by more than one underwriter.

sense. At the issuer level, multiple underwritten bonds are frequently issued by larger firms, in terms of both total assets and market capitalization. However, firms placing their bonds with just one underwriter are more frequent issuers, regardless of whether the issuance is computed at a subsidiary or a parent level. Additionally, issuers that have obtained a loan and issued a bond during the same natural year are more likely to have multiple underwriters, whereas this is not the case if they have issued equity.

Regarding syndicate characteristics, according to mean- and median-difference tests, issuers that hire just one underwriter tend to include more co-managers (an average of 1.98 co-managers) compared to those that hire several underwriters. As for average syndicate reputation[33], this value seems to be higher for multiple underwritten bonds. However, the highly reputable underwriters – those in the top three – are less likely to join a syndicate. Finally, it seems that prior issuer-underwriter relationships are more frequent in multiple underwritten bonds, as is shown using several time windows.

We investigate the determinants of multiple underwritten bonds accounting for deal, issuer and syndicate characteristics using a probit multivariate model. The estimation results are shown in Table III. In order to address the potential correlation in the residuals, since in our sample some firms issue several bonds, we allow for firm-specific effects by clustering standard errors on issuers. We find that bonds with large proceeds are more likely to be placed by a syndicate. This is consistent with the size hypothesis that argues that placing large issues entails greater complexity. In large-proceeds-bonds, hiring more underwriters is believed to facilitate the distribution, because it enlarges the base of potential investors. After controlling for other factors, maturity and callability are not statistically significant determinants of multiple underwritten deals. Bonds denominated in the national currency of the issuer and sold into the domestic market – domestic bonds – are less likely to be placed by several underwriters. This latter

[33] See among others (Andres, Betzer, & Limbach, 2014; Esho, Kollo, & Sharpe, 2006; Fang, 2005; Gande et al., 1997; Iannotta & Navone, 2008; Livingston & Miller, 2000; McCahery & Schwienbacher, 2010; Megginson & Weiss, 1991; R. P. Narayanan, Rangan, & Rangan, 2006; Ross, 2010; Roten & Mullineaux, 2002; Schenone, 2004; Yasuda, 2005).

result supports the view that the reduced distribution effort required in domestic deals would justify choosing just one underwriter rather than a syndicate.[34]

There is no evidence suggesting that firm size[35] is a significant determinant of multiple underwritten deals. Additionally, after controlling for other factors, we find that a lower number of co-managers are observed for multiple underwritten deals and that syndicated deals are more likely to be integrated by a prior co-manager. This supports the proposed substitution effect in Jeon et al. (2015). In contrast to Shivdasani and Song (2011), who report lower underwriter reputation in syndicated deals, we find that, after controlling for other factors, sole and multiple underwritten bonds do not differ in terms of reputation. This result suggests that reputable underwriters are not just involved in sole underwritten bonds; they also participate in syndicates. Furthermore, bond ratings are not significant; therefore, sole underwritten deals are not likely to be related to high-quality issuances. It seems that underwriting syndication is not used exclusively by low-quality issuers searching for more certification. Additionally, the timing of the issue matters: when there is a great volume of simultaneous debt issuance, multiple underwritten deals are more likely. This result is consistent with Gunay and Ursel's (2015) prediction that underwriters limit their production capacity when the market is "hot" as a non-price competitive strategy.

As for the variables that account for prior issuer-bank relationships, previous underwriting, lending and co-managing relationships between issuer and underwriter are found to be significant determinants of multiple underwritten deals. These findings confirm that the syndication choice is likely to be affected by issuer-bank relationships.

Regarding our hypothesis on how the strength of firms' relationships might affect the choice between a single versus multiple underwriter(s), the findings shown in Table IV are in line with our

[34] Alternatively, for robustness purposes, in unreported regressions we have included a dummy for internationally marketed bonds, which are sold in the primary markets of at least two countries. We find that these bonds are more likely to be placed by an underwriter syndicate, supporting the views that as these bonds entail greater complexity, choosing multiple underwriters is justified.

[35] In unreported regressions, we have used the market capitalization of equity as proxy of firm size instead of total assets, and firm size remains statistically insignificant.

predictions. The syndication choice is influenced by the strength of the relationships held by the issuer. Those issuers that have strong relationships with their lenders are less likely to syndicate a bond issuance. Nevertheless, during the crisis, as predicted, the opposite effect is found. When the crisis emerged, those firms with very concentrated lending relationships, i.e. with a high relational Herfindhal index, were more likely to syndicate their bonds. Therefore, while in the past holding exclusive relationships with a few underwriters led firms to opt for sole deals, during the crisis this seems to have changed. This result suggests that firms may decide to syndicate the issuance as a strategy to establish new banking relationships in order to protect themselves from credit restrictions derived from hold-up problems.

As some firms may not have recently established a lending relationship, we assess the robustness of our results by excluding those deals whose issuer had not established a lending relationship within the two years prior to the bond issuance. The results, reported in column 4, are qualitatively similar to the baseline findings. Furthermore, another primary concern is to ensure that extreme cases in firms' relationships do not drive our results. In column 5 we report the results for a subsample of deals whose issuer has a relational index larger than zero but lower than 1. In addition, when alternative time-windows are considered – columns 6 and 7 – results remain robust.

Table V shows the results for the matched sample of bonds based on deal and issuers' characteristics. Regardless of the matching algorithm employed, prior bank-issuer relationships seem to affect the syndication decision. As the negative and statistically significant coefficient of *Relational HHI* suggests, firms that hold exclusive banking relationships are less likely to employ a syndicate. However, during the crisis, the interaction is positive and statistically significant. These findings support our baseline results, as they show that switching behavior for firms highly dependent on single-bank relationships is not driven by fundamental changes in corporate bond market issuances during the crisis.

5.1.2 Firms' relationships as a determinant of matching

Table VI reports the results indicating which banks among a set of potential underwriters are more likely to underwrite an offering. Column 1 presents the estimation results without considering any

previous underwriting or lending relationships. As expected, more reputable underwriters are more likely to be chosen from among the set of potential underwriters by firms issuing bonds. In this sense, this result confirms that, as prior studies show, reputation attracts potential issuers. Firms would like to match their issuance with a highly reputable underwriter, as those issuers acknowledge that underwriter reputation is valuable in capital markets.[36] Furthermore, contrary to information spillover theories, when underwriters concentrate their business in a specific industry, the likelihood of being chosen decreases. It seems that industry diversification is a more satisfactory strategy. In addition, consistent with prior empirical findings, the positive coefficient of *shared nationality* reveals that banks that share a location with the issuer are more likely to be appointed as underwriters. In columns 2–5, all the variables reflecting the existence and strength of prior relationships are included. All the coefficients are positive and significant, which means that throughout the research period, underwriting choice was positively influenced by prior lending and underwriting relationships. These results confirm the importance of past relationships within the bond market. Furthermore, as suggested by the proposed reward mechanism, being the most recent lender or bond underwriter increases the likelihood of serving again as underwriter in the current bond issuance. These findings confirm our initial hypothesis: firms are more likely to choose as underwriters the banks with which they hold lending relationships.

As for the economic significance of lending relationships in columns 6 to 9, we report the marginal effects, multiplied by 100, of being a prior lender, the relationship bank and the most recent lender. We find that being a prior lender (prior underwriter) increases the probability of being chosen by 5.09 percentage points (3.96 percentage points), whilst being the closest lender (underwriter) relationship bank increases the probability of being chosen by 5.85 percentage points (3.72 percentage points). Similarly, being the most recent lender increases the probability of being chosen more than being the more recent underwriter (by 5.96 percentage points versus 2.57 percentage points).

[36] We obtain a similar result using a dummy variable for the Top 5 and 7 underwriters in the annual league tables.

These findings show that lending relationships have a larger influence on the underwriter matching probability than the underwriting relationships themselves. Therefore, as a number of studies have documented, there are effects of cross-market relationships, with firms' relationships carrying over across lending and debt transactions.

The effects of lending relationships on underwriter choice during the financial crisis are shown in Table VII, including interaction terms between the relationship variables and a crisis dummy. These findings suggest that, for a bank, holding lending relationships with a firm during the crisis increased the probability of being chosen as underwriter to a significantly larger extent than in the pre-crisis period. Moreover, the probability of being chosen during the crisis was larger if the underwriter was a lender in the most recent loan granted to the firm, but not if the bank was appointed as underwriter in the most recent bond issuance. This suggests that although underwriting and lending relationships had a large impact on matching during the crisis, the reward mechanism only seems to apply for lending relationships.

For robustness purposes, we explore the effect of the relationships during the financial crisis, distinguishing between firms that were recent borrowers (firms that took out a loan the year before the bond issuance) and those that were not. In columns 6 and 7, we find that even though the effects of lending relationships are present for both kinds of firms, these effects are larger for recent borrowers.

As for the economic significance of these results, we compute the average adjusted predicted probabilities. We find that for a bank having the closest lending relationship with the bond issuer – that is, the main loan provider – the probability of being chosen is higher by 11 points (124%) during the crisis compared to the pre-crisis period. Further, if a bank that was a non-lender before the crisis becomes the closest lender for a firm during the crisis, the probability of being chosen is even greater, at 14 points higher (246%). Thus, although holding a lending relationship with a firm during the crisis is positive in terms of underwriter choice, the effects on the probability are larger if the bank is the closest lender bank.

In order to illustrate how informational asymmetries may mask the rewarding behavior, Figure III plots the predicted probability of a lender bank being chosen in both informational asymmetry scenarios. As expected, Figure III shows that as lending relationships increase in closeness, the probability of being matched increases. Importantly, Figure III shows that the predicted probability for a lender bank is always larger for all percentiles of issuer-lender relationships.[37] After computing the predicted probabilities, we separate the information asymmetries effect from the rewarding behavior effect using a geometric mean similar to the Malmquist index. We find that the change in the predicted probability due to the rewarding effect is 1.56 times larger than the effect due to informational asymmetries. These results confirm that our results are not driven by the larger informational asymmetries that arose during the crisis. The reward mechanism seems to have applied here.

In conclusion, the overall results of Tables VI and VII confirm the industry claims and support our hypothesis about the positive reinforcement effects of lending relationships on underwriter choice during the financial crisis. These findings suggest that financial instability, combined with the existence of credit constraints in the financial markets, is likely to affect firms' choices as they relate to their strategy to access a source of funding in capital markets. Although former relationships are consistently important for firms throughout economic cycles, they seem to be more decisive in periods of turmoil, when markets dry up. Hence, as lender banks are added to the syndicate, these results allow us to argue that the recent increase in multiple underwriting syndication in Europe is best explained by the reinforcing influence of lending relationships on underwriter choice. In consequence, the increased possibility for lending banks to gain market share in the underwriting business led them to incorporate in syndicates, even though the traditional bulge-bracket investment banks maintained their influence. This argument is thus consistent with the reduction in underwriting concentration in European capital markets and mid-tier commercial banks' gain in market share.

[37] Issuer-lender bank relationships are computed as market shares. The maximum value (p100) of issuer-lender relationships would be 1, meaning that the bank has been the sole lender for the issuer in all the firm's loans.

5.2 Syndicate formation: Determinants of syndicate size

As Figures A.I and A.II show, simultaneously with the underwriting syndication trend, firms have moved from having a more exclusive banking relationship to multiple banking relationships. Therefore, differences are also likely to appear in syndicate size. Consequently, then, we investigate the determinants of the number of underwriters in the syndicate. Table VIII reports the coefficients and z-statistics based on issuer-clustered standard errors for the number of underwriters, including the same regressors given in Table III. For all the alternative specifications, the zero-truncated and the self-selection models, all the coefficients accounting for issuer-underwriter relationships are positive and statistically significant. Consistent with prior studies on issuer-underwriter matching, we find that large syndicates are more likely to include banks that have been previously appointed as co-manager, underwriter or lender by the issuer. Additionally, supporting the need for higher distribution capabilities, syndicate size increases with bond size[38] while decreasing for domestically placed bonds.

Conversely, reputation decreases with syndicate size: large syndicates are on average less reputable than small syndicates. This result contrasts with the statistically insignificant coefficient of reputation in the probit estimations of Table III. Taken together, these results suggest that differences in reputation appear as syndicate size increases. Furthermore, bond rating becomes statistically significant, indicating that large syndicates placed debt with lower ratings. These results provide additional insights into syndicate formation. While prior results show that there are no differences in terms of reputation and quality between sole underwritten deals and syndicated deals, the latter findings suggest that differences appear between small and large syndicates.

Shivdasani and Song (2011) argue that, consistent with the certification hypothesis, reputation is less important in syndicated deals. In contrast, we find that syndicated bonds cannot be associated with

[38] To account for a possible non-linear relationship between bond size and syndicate size, we include the square value of bond size. Bond size remains positive and statistically significant, while the square is not significant, suggesting that potential non-linearities between bond size and syndicate size do not affect the results.

poorer underwriter reputation and low credit ratings. Our findings suggest that multiple underwritten deals are associated with poorer underwriter reputation and low ratings only when the syndicate is large. We argue that, as firms have moved from single to multiple relationships, appointing more than one underwriter has become more common. However, the relaxation in the certifying function might not appear because a syndicate is employed, but because a syndicate with a large number of underwriters is employed, in which passive underwriters are likely to appear. Free-riding problems are not likely to appear in small and medium syndicates, where all members are likely to control one another's efforts. This problem is more likely to arise in large syndicates, in which the presence of passive underwriters is recognized. Therefore, complementing Shivdasani and Song (2011), it can be argued that reputation, proxied by underwriters' market share, is less important in large syndicated deals.

This potential explanation coincides in this regard with the industry claims that banks are appointed as passive underwriters in order to reward them for past events. Consequently, their lack of experience in the underwriting industry coupled with the existence of free-riding problems as syndicate size increases are likely to explain the less favorable reputation. The decrease in reputation as syndicate size increases might be explained if, as the industry claims, these additional underwriters come from the lending industry. Since most of the additional underwriters are commercial banks, they tend to be less reputable in the underwriting industry. Therefore, if, as some investment bank chiefs have reported, it is currently more likely to appoint as underwriter a bank with which the firm has a lending relationship, this could explain why large syndicate deals are less reputable.

Acknowledging that categorizing a variable may be statistically problematic, for robustness purposes we classify bonds into four groups according to number of underwriters in order to highlight these differences. This division, based on quantile values, considers sole underwritten deals, small syndicates (2–3 underwriters), medium syndicates (4–5 underwriters) and large syndicates (more than 5 underwriters). All the ancillary or threshold parameters differ significantly from one another, confirming

that the categories cannot be combined. As shown in the last columns of Table VIII, we find no significant differences from baseline results.[39]

5.3 What determines whether a bank joins an underwriting syndicate?

Table IX presents some descriptive statistics of syndicated deals. Overall, these results confirm that while syndicate reputation is not significantly different between small and medium syndicates, large syndicates are significantly less reputable. Furthermore, it is worth mentioning that underwriters in large syndicates are more homogeneous in terms of their reputation than those in small syndicates. In this sense, the standard deviation of syndicate reputation, measured using underwriters' market shares, is lower for large syndicates, as can be seen in Figure A.III. Standard deviation increases as syndicate size decreases, reaching a maximum of 4 underwriters per bond before it begins to fall. Although large syndicates are composed of several underwriters, the reputations of these underwriters are not heterogeneous. Taking together low underwriter heterogeneity and low average reputation in large syndicates, these results suggest that reputable underwriters are less likely to be found in large syndicates. Similarly, it seems that less reputable underwriters are those that decide to join a large syndicate. Assuming that, as the industry argues, in large syndicates some banks do not exert any effort, which consequently risks the deal's success and the underwriters' reputations, these findings would confirm that more reputable banks are less likely to join a large syndicate.

Table X shows the estimation results for the probit models on underwriters' decisions to join a syndicate. As in Table VIII, supporting the size hypothesis, we find that in large-proceeds- and non-domestic bonds, it is more likely to find a syndicate of underwriters. Moreover, as expected, *UW relative bond weight* has a negative coefficient, which means that as a bond becomes more relevant for an underwriter, the underwriter is less likely to accept a joint deal. Further, the regressions show that *relative*

[39] For robustness purposes, in unreported regressions we have explored syndicate size excluding large syndicates (> 5 underwriters). Our results are confirmed, since we find that when large syndicates are excluded, syndicate reputation and bond and issuer rating are not statistically significant.

pipeline is positive, meaning that the busier an underwriter is, in terms of its reputation and market conditions, the more likely it is to accept a syndicated deal. It is worth mentioning the significant negative coefficients of *UW Reputational distance* and *UW Syndicated Reputational Ratio*. The interaction terms reveal that the likelihood of joining a syndicate decreases when the underwriter is amongst the most reputable. Additionally, columns 5 to 8 show that these findings are consistent for count data models on syndicate size.

Taken together, these results suggest that more reputable banks are less likely to be members of a syndicate. As their reputational distance from their counterparts increases, underwriters are less prone to join a syndicate. Hence, after controlling for bond and issuer characteristics, we interpret these findings as consistent with the certification role of reputation in capital markets. Reputable underwriters are members of multiple syndicated deals because the underwriting industry has moved from sole underwritten deals to underwriting syndication. Nevertheless, they are not likely to join a syndicate if they perceive that they are involving themselves primarily with less reputable underwriters. We argue that their reputational concern is what may lead them to refrain from entering into these deals.

5.4 Does syndication come at a cost?

Table XI presents the regressions results of bond spread before and during the crisis. This table shows the second-stage regression results, where in the first stage the selection is modeled with the probit models of section 4.1. As we expected, during the financial crisis, investors are more likely to demand a higher spread for callable and low-rated bonds that are issued by leveraged, lower-profit and first-time issuers. The statistically non-significant coefficient of the inverse Mills ratio that accounts for a non-random syndication choice allows us to claim that in the pre-crisis period issuers' self-selection was not a concern. This result suggests that the issuer's syndication decision was not endogenous with its bond cost. Therefore, bond pricing did not differ between sole and syndicated deals in the pre-crisis period. Nevertheless, in columns 3 and 4 we obtain different outcomes from the estimations during the financial

crisis period. The inverse Mills ratio has a negative and significant effect on the spread, which could be interpreted as indicating the presence of features that simultaneously favor the syndication choice and have a negative effect on bond spread. However, the coefficient of syndicated deals is not significant. These results combined suggest that, during the crisis, issuers self-select into a sole or syndicated deal and that self-selection leads to lower spreads. This is consistent with the possibility that, during the crisis, cost minimization is one of the decision variables that determines the use of a syndicate self-selection process.

6. ROBUSTNESS TESTS

6.1 A flight home effect?

An important concern regarding our baseline findings is that the reward mechanism does not hide a potential home-bias effect. Consequently, we aim to show that the syndication trend is not driven by choosing home-based banks but lender banks. In doing so, we estimate the probability of being chosen for the subsample of underwriters that are based in the same country as the issuer (home-based banks). In addition, we explore whether during the crisis the ratio of home-based underwriters is larger in syndicated bonds than in the pre-crisis period, as well as whether the ratio increases with syndicate size. In Table XII (Panel A), we show that all the relationship variables remain significant, but not the crisis dummy. Thus, during the crisis, the probability of choosing a home-based underwriter is not significantly different than in the pre-crisis period.[40] Table XII shows that during the crisis the ratio of home underwriters in syndicated deals is not significantly larger than before.

6.2 A crisis-driven bond issuance?

Another potential distortive effect may come from the possibility that during the crisis some firms decided to issue corporate bonds at a time when other sources of funding were largely restricted. Thus,

[40] For the sake of brevity, in Table XII we report only the coefficients of the key explanatory variables, although the model is estimated taking all the variables into consideration.

we need to ensure that our results are not driven by the possibility that some firms are over- or under-represented in the sample due to this fact.

First, we re-estimate our models for a subsample of firms that issued at least one bond in both periods: pre-crisis and crisis. As some firms may have issued more bonds in one of these periods, we have randomly selected one bond per firm for each period. Table XIII shows the results, which are fully consistent with the baseline estimations.

6.3. Excluding non-active underwriters

In order to check that the results are not driven by the over-representation of relatively inactive underwriters, we have re-estimated our model excluding those underwriters that issued less than 1% of the total deals in the year of issuance. As shown in Table XIV, both the statistical relationships and the magnitude of the economic effects remain very similar to those of the baseline estimations.

6.4. Alternative time windows and rating dummies

In our analysis, we examine the impact of firms' relationships considering a two-year window before the issuance date. As robustness checks, we have also considered alternative time windows (one-year and three-year windows), with no material change in the results. Furthermore, we also estimated the models including credit-rating dummies rather than a continuous measure, but no significant changes emerged.

7. CONCLUSIONS

The size of underwriting syndicates has risen sharply since 2000, with the increase being particularly steep during the financial crisis. The latest market developments reveal that multiple underwritten bonds are more frequent, as are syndicates formed by a large number of banks. The industry has reported that syndication is the result of issuers' demand, because firms favor their relationship banks as underwriters in difficult times. This issue is particularly relevant for the industry and investors. From the point of view of the industry, the nature of the underwriting industry is changing: firms hold fewer

exclusive relationships and market concentration is being reduced. Furthermore, investors are interested in the issue, because the large syndication phenomenon may affect pricing and post-bond performance.

In this paper, we have analyzed syndicate formation, examining the effects of prior relationships on syndication decisions and underwriter choice using a large sample of corporate bonds issued in Europe. To the best of our knowledge, we are the first to offer an explanation of the debt-underwriting syndication phenomenon. We find that during the financial crisis, firms with exclusive relationships are more likely to employ a syndicate. Furthermore, we find that prior lending relationships had a stronger effect during the crisis: if a bank had the closest lending relationship with the bond issuer, their probability of being chosen increased by 11 points (124%) during the crisis compared to the pre-crisis period. Regarding syndicate formation, we find that reputable banks refrain from joining a syndicate if they perceive that they are matching with less reputable counterparts. Finally, we find that these factors simultaneously favor the syndication choice and negatively affect bond spread. These results are found to be robust over alternative models and identification.

Overall, these results confirm that syndication formation is to a large extent explained by a positive reinforcement of prior relationships, particularly lending relationships, on underwriter matching. Furthermore, during the crisis, firms that held very concentrated relationships opted for a syndicate. Our evidence suggests that the existence of larger syndicates could be motivated by the larger effect of relationships during the crisis. Additionally, our results provide evidence for the certification hypothesis, as reputable underwriters refrain from participating in large syndicates with less reputable counterparts, which is interpreted as driven by reputational concern.

FIGURE I
EVOLUTION OF THE SYNDICATION TREND IN THE EUROPEAN BOND MARKETS

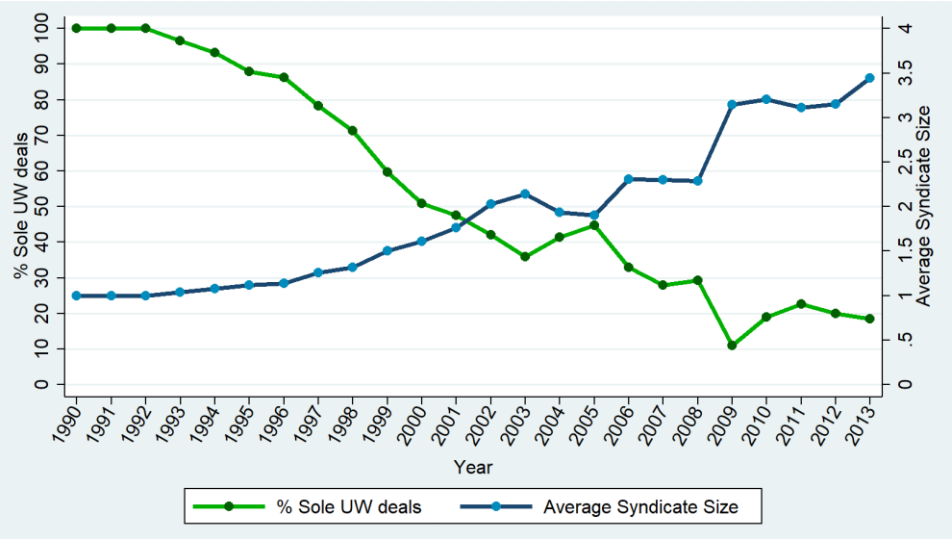


TABLE I
DATABASE AND SAMPLE SUMMARY STATISTICS

Bond Characteristics	Dealogic	Excluding Utilities, Regulated (SIC:4000S) and Financial Firms (SIC:6000S)
Issuer Characteristics	Compustat Global	+ Issuer Accounting information
	Thomson ONE	+ Issuer Lending Relationships

Sample

Bond				**Issuer**			
	Mean	Median			Mean	Median	
Proceeds ($ mill)	621.75	503.50	(1887)	Total Assets ($ bill)	70.39	35.22	(1877)
Maturity (years)	7.40	6.17	(1887)	Total Equity ($ bill)	24.08	11.01	(1873)
Yield (%)	4.71	4.51	(1750)	Leverage	55.59	47.74	(1862)
Coupon (%)	4.68	4.50	(1814)	Net Income ($ bill)	3.91	1.21	(1869)
Gross fees spread (%)	0.56	0.35	(661)	ROA (%)	4.54	4.15	(1868)
Investment Grade	0.85	1	(1887)	Finance Vehicle Issuer	0.41	0	(1887)
Callable	0.25	0	(1887)	First Time Issuer	0.21	0	(1887)
Collateralized	0.03	0	(1887)	Issuer Frequency	15.13	7	(1887)
Private placement	0.09	0	(1887)	Nº Loans (prev. 3 years)	1.20	1	(1887)
Cross Default Issuer	0.42	0	(1887)	Nº Loans (prev. 5 years)	1.95	2	(1887)
Rule 144A	0.14	0	(1887)	Equity & Bond	0.31	0	(1887)

Syndicate			
	Mean	Median	
Nº UW	3.32	3	(1887)
Nº Co-Managers	1.17	0	(1887)
Nº Managers	4.89	4	(1887)
Reputation Top 3	0.08	0	(1887)
Reputation Top 5	0.23	0	(1887)
Reputation Top 7	0.36	0	(1887)

Issuer	437			
Issuer Parents	345			
Underwriters	90			
Nationality	20			
Deals	1505			
Tranches	1887			

Year	**% sole UW deals**	**Mean**	**Median**	**Total**
2003	23.53%	2.50	2	119
2004	16.85%	2.45	2	89
2005	27.94%	2.29	2	68
2006	12.87%	2.84	3	101
2007	14.29%	2.68	2.5	112
2008	16.94%	2.54	2	124
2009	6.44%	2.39	3	233
2010	12.92%	3.62	3	209
2011	5.24%	3.68	3	191
2012	11.01%	3.68	4	345
2013	9.46%	3.91	4	296
Total	12.19%	3.31	3	1887

TABLE II
UNIVARIATE STATISTICS BY NUMBER OF UNDERWRITERS

This table reports the descriptive statistics for our sample of non-financial corporate bonds in Europe during 2003 - 2013 by number of deal underwriters. Mean and median values are reported for deals underwritten by one (sole UW bond) and more than one underwriter (multiple UW bond). We have reported variables that refer specifically to the bond, the issuer and the syndicate. We use two tails t-test for difference in means between the two groups of corporate bonds and Wilcoxom Mann- Whitney test is used for medians. *, **, *** Different is significant at less than 10 %, 5%, 1% level.

	Sole UW bond			Multiple UW bond		
Bond characteristics	**Mean**	**Median**	**Obs**	**Mean**	**Median**	**Obs**
Issue size ($ mill)	182.97	128.21	230	682.65***	605.96***	1657
Maturity (years)	7.09	5.51	230	7.45	6.63**	1657
Coupon (%)	5.07	4.88	215	4.63***	4.45***	1599
Investment Grade (0 | 1)	0.78	1	230	0.86***	1.00***	1657
Cross Default Issuer (0 | 1)	0.43	0	230	0.42	0.00	1657
Make Whole Call (0 | 1)	0.06	0	230	0.20***	0.00***	1657
Spread benchmark (%)	2.57	1.9	51	2.29	1.69	1273
Fungible (0 | 1)	0.31	0	230	0.17***	0.00***	1657
Callable (0 | 1)	0.19	0	230	0.26***	0.00**	1657
Collateralized (0 | 1)	0.05	0	230	0.02**	0.00***	1657
Private Placement (0 | 1)	0.23	0	230	0.07***	0.00***	1657
International Placement (0 | 1)	0.73	1	230	0.92***	1.00***	1657
Domestic Placement (0 | 1)	0.24	0	230	0.06***	0.00***	1657
SEC (0 | 1)	0.03	0	224	0.10***	0.00***	1563
Rule 144A (0 | 1)	0.11	0	230	0.14	0.00	1657
Issuer characteristics	**Mean**	**Median**	**Obs**	**Mean**	**Median**	**Obs**
Total Assets ($ bill)	62.35	19.18	230	71.51*	36.60***	1647
Total Liabilities ($ bill)	39.48	9.46	228	46.23**	22.78***	1646
Total Equity ($ bill)	21.77	4.74	228	24.37	11.33***	1645
Leverage	53.60	43.99	226	55.87	48.05	1636
Net income ($ bill)	4.23	0.45	228	3.86	1.26**	1641
ROA (%)	4.27	4.65	228	4.58	4.13	1640
Stock Market Value ($ bill)	52.84	9.80	220	42.99**	20.29**	1559
First Issuer (0 | 1)	0.26	0	230	0.21	0.00*	1657
Issuer Frequency	27.36	6	230	13.43***	7.00	1657
Issuer Parent Frequency	35.83	7	230	18.21***	10.00	1657
Equity&Bond (0 | 1)	0.33	0	230	0.31	0.00	1657
Loan&Bond (0 | 1)	0.51	1	230	0.59**	1.00**	1657
Syndicate characteristics	**Mean**	**Median**	**Obs**	**Mean**	**Median**	**Obs**
UW previous deal [1 year] (0 | 1)	0.37	0	230	0.43*	0.00*	1657
UW previous deal [3 years] (0 | 1)	0.48	0	230	0.66***	1.00***	1657
UW previous deal [5 years] (0 | 1)	0.52	1	230	0.75***	1.00***	1657
Nº UW	1.00	1	230	3.64***	3.00***	1657
Nº Co-manager	1.98	0	230	1.06***	0.00***	1657
Nº Manager	3.60	1	230	5.06***	4.00***	1657
Avg. UW Syndicate Reputation	3.74	3.35	230	5.02***	4.97***	1657
Reputable UW Top 3 (0 | 1)	0.11	0	230	0.07*	0.00*	1657
Reputable UW Top 5 (0 | 1)	0.17	0	230	0.24**	0.00**	1657
Reputable UW Top 7 (0 | 1)	0.26	0	230	0.37***	0.00***	1657
Relative Issue size [week]	0.18	0.06	230	0.20	0.14***	1657
Relative Issue size [month]	0.03	0.01	230	0.06***	0.04***	1657
Relative Issue size [quarter]	0.01	0.00	230	0.02***	0.01***	1657
UW lender [1 year] (0 | 1)	0.09	0	230	0.25***	0.00***	1657
UW lender [3 years] (0 | 1)	0.14	0	230	0.51***	1.00***	1657
UW lender [5 years] (0 | 1)	0.17	0	230	0.61***	1.00***	1657

TABLE III
DETERMINANTS OF MULTIPLE UNDERWRITEN DEALS

This table presents the coefficients and the z-statistics for the Probit regressions on syndicate choice. The dependent variable is a binary variable that takes the value 1 if the bond is placed by multiple underwriters. All variables are defined in Appendix. Industries dummies are based on SIC classification. Z-statistics are based on issuer clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

	Dep. Var: Multiple Underwritten Deal (0 | 1)					
VARIABLES	(1) Co-manager	(2) Bond UW	(3) Lender	(4) All relationships	(5) Probit (1yr)	(6) Probit (3yr)
Issue size	0.959***	0.981***	0.928***	0.950***	0.965***	0.940***
	(0.0937)	(0.0938)	(0.0934)	(0.0958)	(0.0949)	(0.0944)
Maturity	-0.0670	-0.0774	-0.140	-0.0823	-0.0693	-0.0986
	(0.168)	(0.171)	(0.169)	(0.168)	(0.169)	(0.169)
Callability	-0.186	-0.190	-0.171	-0.206	-0.213	-0.167
	(0.205)	(0.207)	(0.214)	(0.211)	(0.207)	(0.219)
Bond Rating	-0.0527	-0.0450	-0.0367	-0.0454	-0.0459	-0.0391
	(0.0408)	(0.0409)	(0.0418)	(0.0422)	(0.0412)	(0.0438)
Domestic Placement	-0.785**	-0.792**	-0.926**	-0.851**	-0.776**	-0.991**
	(0.364)	(0.363)	(0.374)	(0.375)	(0.372)	(0.386)
Issuer Size	0.00657	-0.0101	-0.00829	-0.0536	-0.0432	-0.0623
	(0.0796)	(0.0777)	(0.0813)	(0.0785)	(0.0777)	(0.0793)
Leverage	-0.00303**	-0.00326**	-0.00262	-0.00307*	-0.00327**	-0.00214
	(0.00141)	(0.00148)	(0.00161)	(0.00168)	(0.00159)	(0.00176)
ROA	0.0547***	0.0571***	0.0649***	0.0633***	0.0606***	0.0648***
	(0.0178)	(0.0176)	(0.0179)	(0.0189)	(0.0188)	(0.0189)
Finance Vehicle	-0.263	-0.276	-0.163	-0.189	-0.221	-0.171
	(0.190)	(0.186)	(0.181)	(0.193)	(0.193)	(0.204)
First time-issuer	0.244	0.273	0.129	0.291	0.298	0.292
	(0.201)	(0.213)	(0.212)	(0.229)	(0.223)	(0.231)
Nº Co-Managers	-0.0588***	-0.0487**	-0.0598***	-0.0642***	-0.0589***	-0.0670***
	(0.0198)	(0.0215)	(0.0211)	(0.0206)	(0.0209)	(0.0206)
UW Syndicate Reputation	-0.0150	-0.0193	-0.0327	-0.0261	-0.0193	-0.0343
	(0.0277)	(0.0280)	(0.0283)	(0.0283)	(0.0282)	(0.0290)
Market Simultaneity	0.150***	0.178***	0.179***	0.170***	0.169***	0.174***
	(0.0469)	(0.0437)	(0.0443)	(0.0447)	(0.0437)	(0.0445)
UW previous co-manager	0.388**			0.374**	0.380**	0.367**
	(0.162)			(0.162)	(0.156)	(0.168)
UW previous bond UW		0.458***		0.431***	0.440***	0.434***
		(0.156)		(0.160)	(0.159)	(0.163)
UW previous lender			0.658***	0.683***	0.482**	0.822***
			(0.200)	(0.205)	(0.216)	(0.207)
Observations	1,629	1,629	1,629	1,629	1,629	1,629
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R2	0.4294	0.4338	0.4399	0.4557	0.4454	0.4652
Log-Likelihood	-318.25	-315.79	-312.40	-303.58	-309.35	-298.29
p-value (chi2)	0.00	0.00	0.00	0.00	0.00	0.00

TABLE IV

DETERMINANTS OF MULTIPLE UNDERWRITEN DEALS: THE STRENGTH OF FIRMS' RELATIONSHIPS

This table presents the coefficients and the z-statistics for the Probit regressions on syndicate choice. The dependent variable is a binary variable that takes the value 1 if the bond is placed by multiple underwriters. X bond features is a vector of variables including issue size, maturity, callability, bond rating, domestic placement and market simultaneity. X issuer features is a vector of variables including firm size, leverage, ROA, finance vehicle, first time-issuer. X syndicate features is a vector of variables including nº co-managers and UW Syndicate Reputation. Relational HHI is the Herfindahl index based on the market shares of all banks who led managed at least a loan for the issuer two years before the bond issuance. All variables are defined in the Appendix. Industries dummies are based on SIC classification. Z-statistics are based on issuer clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

	Dep. Var: Multiple Underwritten Deal (0 | 1)						
	(1)	(2)	(3)	Robustness checks			
VARIABLES	Relational HHI	Relational HHI	Relational HHI	Excluding firms without relationships	Excluding firms with 0 < Rel. HHI < 1	Probit (1yr)	Probit (3yr)
X bond features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X issuer features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X syndicate features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UW previous co-manager	0.340**	0.308*		1.115***	1.041***	0.418**	0.407**
	(0.158)	(0.158)		(0.292)	(0.318)	(0.172)	(0.171)
UW previous bond UW	0.438***	0.418**		0.829*	-0.476	0.584***	0.621***
	(0.163)	(0.164)		(0.436)	(0.338)	(0.176)	(0.193)
UW previous lender	0.748***	0.754***		1.558***	1.707***	0.548**	0.825***
	(0.197)	(0.196)		(0.332)	(0.341)	(0.219)	(0.200)
Relational HHI	-0.715*	-1.358***	-1.204***	-1.672***	-3.487*	-1.159**	-0.834**
	(0.366)	(0.394)	(0.444)	(0.433)	(1.946)	(0.552)	(0.367)
Relational HHI*Crisis		1.812**	5.153***	14.48**	15.41***	2.179***	1.458**
		(0.717)	(1.683)	(5.706)	(5.784)	(0.683)	(0.636)
Observations	1,629	1,629	1,629	778	750	1,629	1,629
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R2	0.4604	0.4708	0.4409	0.5856	0.5366	0.4556	0.4737
Log-Likelihood	-300.95	-295.15	-311.83	-82.36	-75.53	-303.65	-293.54
p-value (chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE V
MATCHING SAMPLE ANALYSIS: DETERMINANTS OF MULTIPLE UNDERWRITEN DEALS

This table presents the coefficients and the z-statistics for the Probit regressions on the matched samples on syndicate choice. The dependent variable is a binary variable that takes the value 1 if the bond is placed by multiple underwriters. In column 1 to 2 the matched samples are obtained using a propensity score one-to-one matching algorithm (without replacement). In column 3 and 4 the matched sample is obtained using a propensity score with a caliper radius equal to 0.0025. In column 5 and 6 the matched sample is obtained using a maximum of four nearest neighbors. We impose common support. X bond features is a vector of variables including issue size, maturity, callability, bond rating, domestic placement and market simultaneity. X issuer features is a vector of variables including firm size, leverage, ROA, finance vehicle, first time-issuer. X syndicate features is a vector of variables including nº co-managers and UW Syndicate Reputation. Relational HHI is the Herfindahl index based on the market shares of all banks who led managed at least a loan for the issuer two years before the bond issuance. All variables are defined in the Appendix. Industries dummies are based on SIC classification. Z-statistics are based on issuer clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

Dep. Var: Multiple Underwritten Deal (0 | 1)						
	Propensity Score one-to-one matching (without replacement)		Propensity Score with caliper radius (caliper= 0.0025)		Propensity Score with Nearest-neighbor matching (n=4)	
VARIABLES	Relationship variables	Relational HHI	Relationship variables	Relational HHI	Relationship variables	Relational HHI
X bond features	Yes	Yes	Yes	Yes	Yes	Yes
X issuer features	Yes	Yes	Yes	Yes	Yes	Yes
X syndicate features	Yes	Yes	Yes	Yes	Yes	Yes
UW previous co-manager	0.459**	0.384*	0.840***	0.710***	0.354*	0.240
	(0.201)	(0.197)	(0.224)	(0.228)	(0.207)	(0.207)
UW previous bond UW	0.585***	0.572***	0.377*	0.363*	0.283*	0.257*
	(0.176)	(0.179)	(0.252)	(0.251)	(0.232)	(0.224)
UW previous lender	0.578***	0.672***	0.351*	0.354*	0.863***	0.936***
	(0.195)	(0.196)	(0.249)	(0.261)	(0.243)	(0.226)
Relational HHI		-1.203***		-1.483***		-1.571***
		(0.373)		(0.475)		(0.453)
Relational HHI*Crisis		2.350*		3.433**		1.685***
		(1.449)		(1.877)		(0.634)
Observations	1,150	1,150	1,694	1,694	2,332	2,332
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R2	0.4598	0.4741	0.4529	0.4745	0.4242	0.4437
Log-Likelihood	-242.59	-236.15	-298.41	-286.62	-450.21	-434.98
p-value (chi2)	0.00	0.00	0.00	0.00	0.00	0.00

TABLE VI
EFFECTS OF LENDING RELATIONSHIPS ON UNDERWRITER CHOICE

This table presents the coefficients, the z-statistics and the marginal effects for the Probit regressions for the determinants of being chosen as underwriter in a given deal. All variables are defined in the Appendix. Marginal Effects of column Columns 6 and 7 are computed from estimates of Column 3 and 4. In Column 6 and 7 the values represent the effect on probability when the relationship measures goes from zero to one. Coefficients and standard errors are multiplied by 100. Industries dummies are based on SIC classification. Z-statistics are based on bond clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1%.

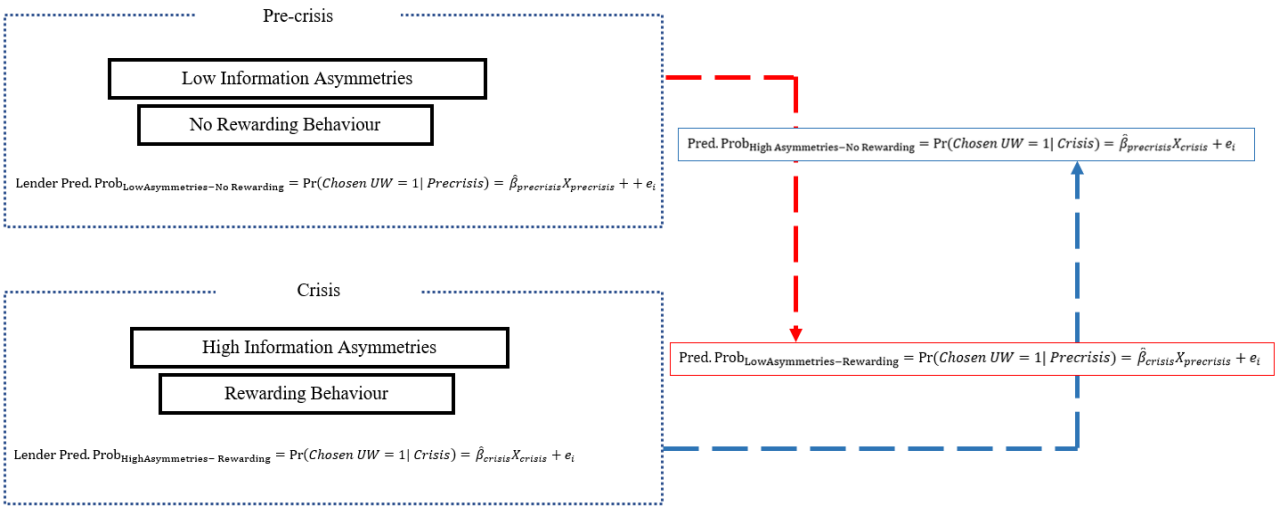
	Dep. Var: UW Chosen (0 | 1)							
VARIABLES	Coefficients 2003 - 2013					Marginal Effects (x100)		
Issue size	0.162***	0.157***	0.158***	0.164***	0.160***			
	(0.0101)	(0.0105)	(0.0115)	(0.0102)	(0.0111)			
Maturity	-0.0132	-0.0130	-0.0160	-0.0111	-0.0314*			
	(0.0140)	(0.0148)	(0.0173)	(0.0141)	(0.0171)			
Callability	0.0325*	0.0198	0.0454**	0.0312*	0.0692***			
	(0.0169)	(0.0178)	(0.0214)	(0.0170)	(0.0201)			
Domestic Placement	-0.144***	-0.152***	-0.109***	-0.147***	-0.0828***			
	(0.0245)	(0.0267)	(0.0268)	(0.0245)	(0.0277)			
Investment Grade	-0.0218	-0.00866	-0.0171	-0.0210	-0.0458			
	(0.0244)	(0.0262)	(0.0290)	(0.0245)	(0.0279)			
Issuer size	0.0178**	0.0109	-0.0479***	0.0151**	-0.00984			
	(0.00706)	(0.00779)	(0.00913)	(0.00712)	(0.00832)			
Leverage	0.0229	0.0778	0.106*	0.0211	0.105*			
	(0.0539)	(0.0578)	(0.0623)	(0.0541)	(0.0580)			
ROA	-0.00303*	-0.00156	0.00206	-0.00281*	0.00253			
	(0.00167)	(0.00185)	(0.00204)	(0.00170)	(0.00170)			
Finance Vehicle	-0.0213	0.0187	0.0231	-0.0195	-0.00110			
	(0.0180)	(0.0193)	(0.0233)	(0.0182)	(0.0203)			
First time issuer	0.0146	0.0638***	0.0739***	0.0191	0.0437**			
	(0.0180)	(0.0202)	(0.0217)	(0.0182)	(0.0210)			
UW Reputation	0.138***	0.119***	0.108***	0.136***	0.113***			
	(0.00329)	(0.00344)	(0.00356)	(0.00331)	(0.00345)			
UW Industry specialization	-0.898***	-0.809***	-0.714***	-0.897***	-0.722***			
	(0.0425)	(0.0420)	(0.0427)	(0.0426)	(0.0433)			
Shared nationality	0.885***	0.740***	0.709***	0.871***	0.689***			
	(0.0243)	(0.0251)	(0.0249)	(0.0244)	(0.0240)			
UW Mkt. Share		2.186***						
		(0.132)						
Lender Mkt.Share		3.823***						
		(0.269)						
Prior UW			0.517***			3.96***		
			(0.0282)			(0.00215)		
Prior Lender			0.666***			5.09***		
			(0.0237)			(0.00174)		
Max Relationship UW				0.453***			3.72***	
				(0.0653)			(0.536)	
Max Relationship Lender				0.712***			5.85***	
				(0.117)			(0.963)	
UW Latest Bond UW					0.333***			2.57***
					(0.0425)			(0.00327)
UW Latest Lender					0.773***			5.96***
					(0.0228)			(0.00172)
Observations	114,399	114,399	114,399	114,399	114,399			
Year	Yes	Yes	Yes	Yes	Yes			
Industries	Yes	Yes	Yes	Yes	Yes			
Countries	Yes	Yes	Yes	Yes	Yes			
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered			
Pseudo R^2	0.2563	0.2912	0.3057	0.2587	0. 3037			
Log-Likelihood	-17790.3	-16956.7	-16608.1	-17732.9	-16657.6			
p-value (chi2)	0.00	0.00	0.00	0.00	0.00			

TABLE VII
EFFECTS OF LENDING RELATIONSHIPS ON UNDERWRITER CHOICE DURING THE FINANCIAL CRISIS

This table presents the coefficients, the z-statistics and the marginal effects for the Probit regressions for the determinants of being chosen as underwriter in a given deal. All variables are defined in the Appendix. X bond features is a vector of variables including issue size, maturity, callability, domestic placement, investment grade. X issuer features is a vector of variables including firm size, leverage, ROA, finance vehicle, first time-issuer. X syndicate features is a vector of variables including nº co-managers. X underwriters features is a vector of variables including UW Reputation, UW Industry specialization and Shared nationality. Columns 6 and 7 consider a subsample of recent borrowers (firms that took out a loan the year before the bond issuance) and non-recent borrowers during the crisis. Industries dummies are based on SIC classification. Z-statistics are based on bond clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

	Dep. Var: UW Chosen (0 | 1)						
VARIABLES	**Crisis Effects**					**Crisis=1**	
						Recent Borrowers=1	**Recent Borrowers=0**
X bond features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X issuer features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X syndicate features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X underwriter features	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UW Mkt. Share	2.154***					2.352***	1.773***
	(0.132)					(0.252)	(0.235)
Prior UW		0.514***					
		(0.0283)					
Max Relationship UW			0.454***				
			(0.0653)				
Lender Mkt.Share	2.452***					5.057***	3.696***
	(0.335)					(0.510)	(0.533)
Lender Mkt.Share*Crisis	2.256***						
	(0.492)						
Prior Lender		0.594***					
		(0.0406)					
Prior Lender*Crisis		0.0943**					
		(0.0463)					
Max Relationship Lender			0.319**				
			(0.187)				
Max Relationship Lender*Crisis			0.676***				
			(0.236)				
UW Latest Bond UW				0.394***			
				(0.0765)			
UW Latest Bond UW*Crisis				-0.0816			
				(0.0904)			
UW Latest Lender				0.647***	0.916***		
				(0.0415)	(0.0287)		
UW Latest Lender*Crisis				0.160***			
				(0.0472)			
UW Latest Lender*Time Latest Loan					-0.000514***		
					(8.34e-05)		
UW Latest Lender*Time Latest Loan *Crisis					0.000356***		
					(8.03e-05)		
Observations	114,399	114,399	114,399	114,399	114,399	42,843	45,267
Year	Crisis Dummy	Crisis Dummy	Crisis Dummy	Crisis Dummy	Crisis Dummy	-	-
Industries	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R^2	0.2929	0.3059	0.2589	0.3040	0.3018	0.3426	0.2758
Log-Likelihood	-16915.1	-16603.8	-17727.9	-16649.2	-16702.2	-5973.8	-6682.8
p-value (chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FIGURE II
THE IMPACT OF FIRMS' RELATIONSHIPS: REWARDING LENDERS OR INFORMATIONAL ASYMMETRIES



Rewarding Hypothesis:

Lender Pred. Prob$_{\text{High Asymmetries– Rewarding}}$ − Lender Pred. Prob$_{\text{High Asymmetries – No Rewarding}} > 0$

Lender Pred. Prob$_{\text{Low Asymmetries– Rewarding}}$ − Lender Pred. Prob$_{\text{Low Asymmetries – No Rewarding}} > 0$

$$\text{Geometric mean} = \underbrace{\sqrt{\frac{\text{Pred.Prob}_{\text{High Asymmetries–Rewarding}}}{\text{Pred.Prob}_{\text{Low Asymmetries–Rewarding}}} \cdot \frac{\text{Pred.Prob}_{\text{High Asymmetries–No Rewarding}}}{\text{Pred.Prob}_{\text{LowAsymmetries–No Rewarding}}}}}_{\text{Informational Asymmetries Effect}} \cdot \underbrace{\sqrt{\frac{\text{Pred.Prob}_{\text{Low Asymmetries–Rewarding}}}{\text{Pred.Prob}_{\text{Low Asymmetries–No Rewarding}}} \cdot \frac{\text{Pred.Prob}_{\text{High Asymmetries–Rewarding}}}{\text{Pred.Prob}_{\text{High Asymmetries–No Rewarding}}}}}_{\text{Rewarding Behavior Effect}}$$

FIGURE III
LENDER'S BANK PROBABILITY OF BEING CHOSEN OVER DIFFERENT INFORMATIONAL AYSMMETRIES SCENARIOS

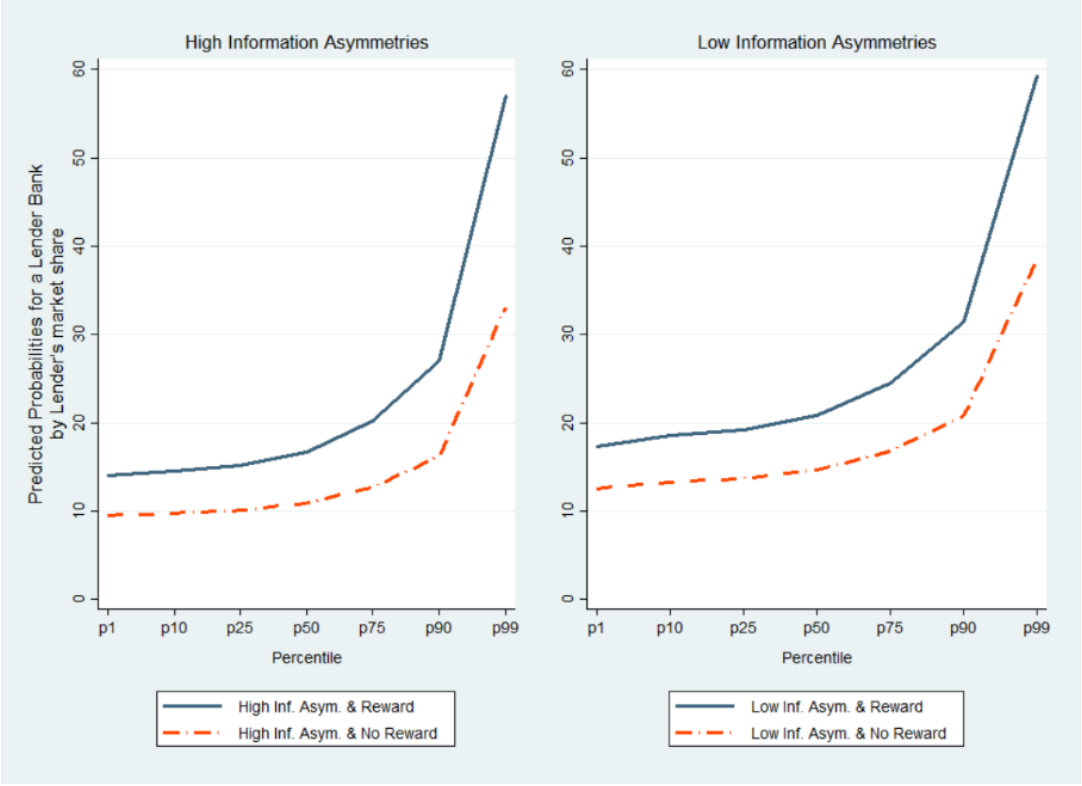


TABLE VIII
DETERMINANTS OF THE NUMBER OF UNDERWRITERS

This table presents the coefficients and the z-statistics for the regressions on the number of bond underwriters. Columns 1 to 4 report the results for the Zero-Truncated Poisson regressions. Column 5 to 8 report the results for the Ordered Probit regressions on the size of the syndicate. Column 9 reports the results for the Second-stage baseline OLS regressions on the number of bond underwriters. In this regression, the dependent variable is the number of banks in the syndicate for multiple underwritten deals. In the first-stage we use a probit model in which the dependent variable takes the value 1 if the bond is a syndicated deal. Industries dummies are based on SIC classification. Z-statistics are based on issuer clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

	Dep. Var: Number of Underwriters					**Dep. Var:** Size (1 – 4)			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
VARIABLES	ZTP Co-manager	ZTP Bond UW	ZTP Lender	ZTP All relationships	OLS Second stage Results	OProbit Co-manager	OProbit Bond UW	OProbit Lender	OProbit All relationships
Issue Size	0.418***	0.420***	0.408***	0.412***	1.105***	0.910***	0.922***	0.886***	0.903***
	(0.0350)	(0.0357)	(0.0359)	(0.0358)	(0.155)	(0.0603)	(0.0620)	(0.0596)	(0.0608)
Maturity	0.0123	0.00640	0.00719	0.00941	-0.00105	0.0933	0.0834	0.0793	0.0859
	(0.0369)	(0.0382)	(0.0377)	(0.0362)	(0.112)	(0.0877)	(0.0882)	(0.0876)	(0.0855)
Callablility	0.0297	0.0260	0.0368	0.0274	0.0698	-0.0190	-0.0366	-0.000898	-0.0262
	(0.0421)	(0.0425)	(0.0437)	(0.0433)	(0.151)	(0.110)	(0.111)	(0.113)	(0.114)
Bond Rating	-0.0358***	-0.0337***	-0.0325***	-0.0330***	-0.0919**	-0.0775***	-0.0754***	-0.0700**	-0.0720***
	(0.0110)	(0.0109)	(0.0114)	(0.0112)	(0.0378)	(0.0270)	(0.0262)	(0.0273)	(0.0269)
Domestic Placement	-0.580***	-0.588***	-0.602***	-0.596***	-1.272***	-1.143***	-1.153***	-1.203***	-1.178***
	(0.150)	(0.145)	(0.147)	(0.142)	(0.255)	(0.302)	(0.293)	(0.303)	(0.292)
Issuer size	0.0152	0.00417	0.0171	-0.00221	0.0307	0.0578	0.0321	0.0601	0.0151
	(0.0259)	(0.0267)	(0.0267)	(0.0270)	(0.0853)	(0.0575)	(0.0560)	(0.0586)	(0.0579)
Leverage	-0.000875	-0.000978	-0.000726	-0.000821	-0.00314	-0.00173	-0.00205	-0.00129	-0.00170
	(0.000672)	(0.000667)	(0.000672)	(0.000663)	(0.00218)	(0.00144)	(0.00139)	(0.00146)	(0.00143)
ROA	-0.000681	-6.57e-05	0.000409	-0.000115	-0.0148	0.0115	0.0130	0.0149	0.0134
	(0.00459)	(0.00470)	(0.00470)	(0.00473)	(0.0164)	(0.0122)	(0.0123)	(0.0122)	(0.0123)
Finance Vehicle	-0.0770	-0.0746	-0.0565	-0.0601	-0.137	-0.210*	-0.215*	-0.151	-0.169
	(0.0526)	(0.0521)	(0.0515)	(0.0514)	(0.161)	(0.111)	(0.110)	(0.110)	(0.114)
First time issuer	0.0125	0.0209	-0.00536	0.0386	0.160	0.0861	0.134	0.0516	0.161
	(0.0526)	(0.0533)	(0.0537)	(0.0525)	(0.180)	(0.127)	(0.132)	(0.128)	(0.134)
Nº Co-Managers	-0.00859	-0.00516	-0.00773	-0.00941	-0.0228	-0.0224	-0.0158	-0.0225	-0.0241
	(0.00930)	(0.00953)	(0.00954)	(0.00945)	(0.0244)	(0.0193)	(0.0206)	(0.0201)	(0.0196)
UW Syndicate Reputation	-0.0292***	-0.0305***	-0.0320***	-0.0313***	-0.108***	-0.0424*	-0.0461*	-0.0508**	-0.0497**
	(0.0104)	(0.0107)	(0.0106)	(0.0104)	(0.0308)	(0.0233)	(0.0237)	(0.0240)	(0.0238)
Market Simultaneity	0.0311	0.0350	0.0344	0.0301	0.0683	0.0425	0.0525	0.0503	0.0458
	(0.0230)	(0.0217)	(0.0218)	(0.0218)	(0.0570)	(0.0552)	(0.0514)	(0.0518)	(0.0524)
UW previous co-manager	0.102***			0.0953***	0.276*	0.199**			0.172*
	(0.0374)			(0.0369)	(0.141)	(0.0913)			(0.0929)
UW previous UW		0.105***		0.0908**	0.362**		0.314***		0.289***
		(0.0393)		(0.0405)	(0.147)		(0.0986)		(0.102)
UW previous lender			0.0917**	0.0867**	0.325**			0.288***	0.281***
			(0.0376)	(0.0375)	(0.139)			(0.0898)	(0.0905)
Inverse Mills Ratio					1.259***				
					(0.431)				
Constant cut1						2.274***	2.415***	2.614***	2.323***
						(0.741)	(0.709)	(0.719)	(0.717)
Constant cut2						4.533***	4.678***	4.885***	4.614***
						(0.746)	(0.719)	(0.732)	(0.726)
Constant cut3						6.025***	6.177***	6.380***	6.124***
						(0.767)	(0.739)	(0.753)	(0.746)
Observations	1,629	1,629	1,629	1,629	1,453	1,629	1,629	1,629	1,629
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R^2 / R-squared	0.1472	0.1469	0.1469	0.1493	0.3677	0.2715	0.2743	0.2740	0.2804

TABLE IX
UNIVARIATE STATISTICS BY SYNDICATE SIZE

This table reports the descriptive statistics by syndicate size. Small syndicates are those with 2 - 3 underwriters. Medium syndicates are those with 4 -5 underwriters and large syndicates are those with more than 5 underwriters. UW Syndicate Reputation is the average market share of the syndicate underwriters. Std. Dev. Syndicate Reputation is the average standard deviation market share of the syndicate underwriters. Syndicate Ratio UW rep/Less rep is a ratio computed dividing the market share of the most reputable UW of the syndicate by the market share of the less reputable UW of the syndicate. Syndicate Ratio UW rep/Synd rep is a ratio computed dividing the market share of the most reputable UW by the average market share of the syndicate underwriters.

	Small Syndicate			Medium Syndicate			Large Syndicate			Small vs Med	Medium vs Large	Small vs Large
	mean	p1	p90	mean	p1	p90	mean	p1	p90			
Syndicate Reputation	5.01	0.08	8.27	5.19	1.83	7.57	4.47	1.60	5.70	-1.45	6.90***	4.68**
Std. Dev. Syndicate Reputation	2.44	0.00	4.85	2.65	0.59	4.06	2.25	0.92	3.22	-2.79**	6.01***	2.47*
Syndicate Ratio UW rep/Less rep	7.53	1.00	13.22	10.47	1.21	14.73	36.06	1.45	41.96			
Syndicate Ratio UW rep/Synd rep	1.47	1.00	1.90	1.66	1.10	2.16	1.77	1.16	2.19			
		n=901			n=568			n=194				

TABLE X
DETERMINANTS FOR AN UNDERWRITER OF JOINING A SYNDICATED DEAL

This table presents the coefficients and the z-statistics for the regressions on the determinants of joining a syndicated deal. Columns 1 to 4 reports the results for the Probit regressions on the determinants of joining a syndicated deal. Columns 5 to 8 reports the results for the Zero-Truncated Poisson regressions on the determinants of joining deals with a number of underwriters. All variables are defined in the Appendix. Industries dummies are based on SIC classification. Z-statistics are based on bond clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

VARIABLES	**Dep. Var:** Multiple Underwritten Deal (0 | 1)				**Dep. Var:** Nº of UWs for multiple UW deals			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Issue Size	0.883***	0.840***	0.905***	0.797***	0.348***	0.333***	0.352***	0.332***
	(0.0557)	(0.0546)	(0.0575)	(0.0513)	(0.0355)	(0.0374)	(0.0348)	(0.0376)
Maturity	-0.0455	-0.0889	-0.0470	-0.127	-0.0348	-0.0440	-0.0346	-0.0446
	(0.108)	(0.107)	(0.108)	(0.106)	(0.0335)	(0.0354)	(0.0332)	(0.0354)
Callablility	0.0596	0.0335	0.0890	0.0854	0.0367	0.0332	0.0377	0.0329
	(0.143)	(0.141)	(0.144)	(0.138)	(0.0397)	(0.0414)	(0.0393)	(0.0414)
Domestic Placement	-0.556***	-0.504***	-0.554***	-0.390**	-0.457***	-0.413***	-0.466***	-0.410***
	(0.183)	(0.180)	(0.182)	(0.172)	(0.0649)	(0.0669)	(0.0647)	(0.0665)
Investment Grade	0.258	0.266*	0.264*	0.257*	-0.116**	-0.120**	-0.118**	-0.120**
	(0.159)	(0.159)	(0.158)	(0.154)	(0.0568)	(0.0581)	(0.0565)	(0.0581)
Issuer size	0.0486	0.0486	0.0526	0.0467	0.00347	0.00574	0.00458	0.00603
	(0.0481)	(0.0471)	(0.0484)	(0.0456)	(0.0193)	(0.0204)	(0.0191)	(0.0204)
Leverage	7.20e-05	6.55e-05	8.37e-05	-6.44e-05	-0.000362	-0.000369	-0.000368	-0.000371
	(0.000409)	(0.000408)	(0.000404)	(0.000435)	(0.000285)	(0.000296)	(0.000284)	(0.000297)
ROA	0.0224*	0.0207*	0.0228*	0.0185*	-0.0103***	-0.0109***	-0.0101***	-0.0109***
	(0.0121)	(0.0119)	(0.0119)	(0.0111)	(0.00346)	(0.00352)	(0.00346)	(0.00353)
Finance Vehicle	-0.257**	-0.229*	-0.253**	-0.202*	-0.0425	-0.0405	-0.0436	-0.0404
	(0.121)	(0.122)	(0.121)	(0.118)	(0.0429)	(0.0446)	(0.0425)	(0.0446)
First time issuer	0.139	0.164	0.145	0.160	-0.0377	-0.0361	-0.0403	-0.0363
	(0.135)	(0.135)	(0.135)	(0.134)	(0.0395)	(0.0418)	(0.0392)	(0.0418)
Nº Co-Managers	-0.0510***	-0.0453***	-0.0519***	-0.0464***	-0.00747	-0.00852	-0.00782	-0.00859
	(0.0134)	(0.0136)	(0.0134)	(0.0131)	(0.00578)	(0.00627)	(0.00573)	(0.00630)
UW Rel. bond weight	-1.205***	-0.977***	-1.278***	-0.878***	-0.563***	-0.412***	-0.594***	-0.411***
	(0.140)	(0.130)	(0.143)	(0.123)	(0.0537)	(0.0540)	(0.0552)	(0.0540)
Relative Pipelane	0.333***	0.338***	0.309***	0.308***	0.160***	0.159***	0.156***	0.158***
	(0.0949)	(0.100)	(0.0896)	(0.0981)	(0.0119)	(0.0127)	(0.0115)	(0.0129)
UW Reputational Distance	-0.163***		-0.373***		-0.0921***		-0.153***	
	(0.0413)		(0.0888)		(0.00819)		(0.0179)	
UW Syndicated Reputational Ratio		-0.154***		-0.375***		-0.0738***		-0.0894***
		(0.0338)		(0.0617)		(0.0138)		(0.0209)
TOP 7 Rep UW * UW Reputational Distance			-0.155***				-0.0951***	
			(0.0432)				(0.00825)	
TOP 7 Rep UW * UW Syndicated Reputational Ratio				-0.0610**				-0.0754***
				(0.0365)				(0.0140)
Observations	6,122	6,122	6,122	6,122	6,122	6,122	6,122	6,122
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R^2	0.4155	0.4207	0.4235	0.4242	0.1390	0.1330	0.1400	0.1330
Log- Likelihood	-565.474	-560.42512	-557.67877	-556.97356	-11339.44	-11418.11	-11326.37	-11417.68
p-value (chi2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE XI
BOND PRICING: Second-stage results

This table presents the coefficients of the Heckman selectivity model regression for the Second-stage OLS estimations for non-financial corporate bonds issued in Europe from 2003 - 2013. The dependent variable is the bond spread in bps. In the first-stage we use a probit model in which the dependent variable takes the value 1 if the bond is a syndicated deal as in Table IV. The inverse Mills-ratio is obtained from first-stage probit estimations to control for syndication choice endogeneity bias. All variables are defined in the Appendix. Z-statistics are based on issuer clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

	Dep. Var: Spread to Benchmark (bps)			
VARIABLES	**Pre-crisis**		**Crisis**	
Issue size	-4.385	-4.421	-6.623	-7.083
	(13.60)	(13.51)	(7.464)	(7.446)
Maturity	21.20***	21.23***	7.420	7.506
	(7.309)	(7.290)	(11.69)	(11.67)
Callability	96.60***	96.87***	29.85***	30.08***
	(17.88)	(17.59)	(10.88)	(10.98)
Purpose: Debt Repayment	-4.408	-5.291	-11.29	-10.33
	(17.34)	(16.66)	(11.86)	(11.91)
Bond Rating	-26.36***	-26.35***	-46.31***	-46.19***
	(2.968)	(2.989)	(4.091)	(4.096)
Fungible	3.604	3.633	8.221	8.479
	(13.96)	(14.14)	(14.33)	(14.31)
Private placement	-53.89**	-54.42**	-40.94**	-43.23**
	(24.76)	(25.24)	(17.53)	(17.22)
First-time issuer	-1.708	-1.645	20.46*	20.08*
	(17.37)	(17.47)	(14.83)	(14.72)
Issuer Size	5.927	5.946	1.653	2.001
	(5.864)	(5.800)	(7.429)	(7.348)
Leverage	0.104	0.104	0.353*	0.356*
	(0.175)	(0.175)	(0.200)	(0.203)
ROA	-1.234	-1.216	-3.019**	-3.078***
	(1.514)	(1.520)	(1.177)	(1.174)
UW reputation	3.290	3.257	4.718	5.001
	(2.255)	(2.177)	(3.439)	(3.311)
UW previous bond UW	-5.050	-4.844	-31.46***	-32.90***
	(11.41)	(11.51)	(11.14)	(11.10)
UW previous lender	1.011	1.391	14.00	13.44
	(11.50)	(10.52)	(10.29)	(10.27)
Syndicated Bond (0|1)		-4.736		38.74
		(36.04)		(36.31)
Inverse Mills Ratio	-7.751	-10.23	-75.88***	-61.64**
	(28.82)	(29.81)	(24.15)	(24.88)
Observations	436	436	904	904
Year	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered
R-squared	0.663	0.663	0.697	0.697

TABLE XII

ROBUSTNESS: TESTING A FLIGHT HOME EFFECT

This table presents the coefficients and the z-statistics for the regressions that test the flight home effect. Panel A (left hand side) presents the coefficients and the z-statistics for the Probit regressions for the determinants of being chosen as home-based underwriter in a given deal. Panel B (right hand side) presents the coefficients and the z-statistics for the regressions on the syndication choice and the number of bond underwriters. All variables are defined in the Appendix. Z-statistics are based on issuer and bond clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

Panel A.	**Dep. Var:** Home-based UW Chosen (0 | 1)			**Panel B.**	**Dep. Var:** Multiple UW Deal (0 | 1)	**Dep. Var:** Syndicate Size	**Dep. Var:** Nº UWs	**Dep. Var:** Nº UWs
VARIABLES	**Subsample of home-based UWs**			VARIABLES	**Probit**	**ZTP**	**OProbit**	**OLS: Second stage-results**
X bond features	Yes	Yes	Yes	X bond features	Yes	Yes	Yes	Yes
X issuer features	Yes	Yes	Yes	X issuer features	Yes	Yes	Yes	Yes
X syndicate features	Yes	Yes	Yes	X syndicate features	Yes	Yes	Yes	Yes
X underwriter features	Yes	Yes	Yes	UW previous co-manager	0.385**	0.0953***	0.178*	0.280**
					(0.159)	(0.0366)	(0.0920)	(0.142)
UW Mkt. Share	0.444**			UW previous bond UW	0.432***	0.0920**	0.290***	0.361**
	(0.184)				(0.162)	(0.0401)	(0.102)	(0.147)
Lender Mkt.Share	2.376***			UW previous lender	0.645***	0.0758**	0.253***	0.311**
	(0.287)				(0.213)	(0.0378)	(0.0924)	(0.141)
Prior UW		0.0880*		Ratio of Home UWs	0.563	0.245*	0.482*	0.251*
		(0.0480)			(0.445)	(0.0962)	(0.223)	(0.202)
Prior Lender		0.379***		Ratio of Home UWs*Crisis	-0.122	-0.0872	-0.0796	-0.0189
		(0.0412)			(0.482)	(0.0857)	(0.238)	(0.268)
Max Relationship UW			-0.0609	Constant cut1			2.794***	
			(0.101)				(0.810)	
Max Relationship Lender			0.616***	Constant cut2			5.107***	
			(0.175)				(0.832)	
Crisis	-0.111	-0.0629	-0.132	Constant cut3			6.619***	
	(0.171)	(0.167)	(0.170)				(0.851)	
				Inverse Mills Ratio				1.295***
								(0.445)
Observations	8,841	8,841	8,841	Observations	1,629	1,629	1,629	1,453
Year	Crisis	Crisis	Crisis	Year	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Industries	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Countries	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Standard Errors	Clustered	Clustered	Clustered	Clustered
Pseudo R^2	0.2284	0.2262	0.2158	Pseudo R^2	0.460	0.1507	0.2838	0.369
Log-Likelihood	-3594.4	-3604.8	-3653.2	Log-Likelihood	-300.4	-2671.1	-1403.9	-
p-value (chi2)	0.00	0.00	0.00	p-value (chi2)	0.00	0.00	0.00	0.00

TABLE XIII

ROBUSTNESS: A CRISIS DRIVEN BOND ISSUANCE?

This table presents the coefficients and the z-statistics for the regressions that test if the results are explained by a bond issuance driven by the crisis. Column 1 and 2 presents the results of the regressions for the determinants of being chosen as underwriter in a given deal while column 3 and 4 present the results of the regressions on the syndication choice. Column 1 and 3 presents the results on a sub-sample of bonds of issued by firms issuing in the pre-crisis and crisis periods. Column 2 and 4 present the results for a random selection of one bond at each period for firms issuing in the pre-crisis & crisis. All variables are defined in the Appendix. Z-statistics are based on clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

Panel A.	**Dep. Var:** UW Chosen (0 | 1)		**Panel B.**	**Dep. Var:** Multiple UW Deal (0 | 1)	
VARIABLES	**Subsample of firms issuing in the pre-crisis & crisis**	**Random selection of one bond at each period for firms issuing in the pre-crisis & crisis**	VARIABLES	**Subsample of firms issuing in the pre-crisis & crisis**	**Random selection of one bond at each period for firms issuing in the pre-crisis & crisis**
X bond features	Yes	Yes	X bond features	Yes	Yes
X issuer features	Yes	Yes	X issuer features	Yes	Yes
X syndicate features	Yes	Yes	X syndicate features	Yes	Yes
X underwriter features	Yes	Yes	UW previous co-manager	0.316*	0.00923
				(0.167)	(0.432)
UW Mkt. Share	2.279***	2.038***	UW previous bond UW	0.451***	0.451*
	(0.147)	(0.352)		(0.165)	(0.442)
Lender Mkt.Share	2.488***	3.382***	UW previous lender	0.770***	0.785*
	(0.349)	(0.831)		(0.234)	(0.461)
Lender Mkt.Share*Crisis	3.862***	5.270***	Relational HHI	-1.559***	-1.914**
	(0.401)	(1.216)		(0.381)	(0.751)
			Relational HHI*Crisis	1.983**	9.831*
				(0.894)	(5.866)
Observations	82,022	12,888	Observations	1,380	224
Year	Yes	Yes	Year	Yes	Yes
Industries	Crisis	Crisis	Industries	Yes	Yes
Countries	Yes	Yes	Countries	Yes	Yes
Standard Errors	Bond Clustered	Issuer Clustered	Standard Errors	Bond Clustered	Issuer Clustered
Pseudo R^2	0.2778	0.3530	Pseudo R^2	0.5164	0.6210
Log-Likelihood	-12845.6	-1821.9	Log-Likelihood	-238.5	-27.26
p-value (chi2)	0.00	0.00	p-value (chi2)	0.00	0.00

TABLE XIV

ROBUSTNESS: EXCLUDING NON-ACTIVE UNDERWRITERS

This table presents the coefficients for the Probit regressions for the determinants of being chosen as underwriter in a given deal. The choice set includes all banks that have underwritten more than 1% of the deals in the year of the bond issuance. All variables are defined in the Appendix. Industries dummies are based on SIC classification. Z-statistics are based on bond clustered standard errors. A constant term (not reported) is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

VARIABLES	**Dep. Var:** UW Chosen (0 | 1)		
	Excluding non-active UWs (with <1% mkt. share deals)		
X bond features	Yes	Yes	Yes
X issuer features	Yes	Yes	Yes
X syndicate features	Yes	Yes	Yes
X underwriter features	Yes	Yes	Yes
UW Mkt.Share	2.098***		
	(0.132)		
Prior UW		0.492***	
		(0.0283)	
Max Relationship UW			0.438***
			(0.0646)
Lender Mkt.Share	2.540***		
	(0.337)		
Lender Mkt.Share*Crisis	2.303***		
	(0.506)		
Prior Lender		0.625***	
		(0.0408)	
Prior Lender*Crisis		0.0564**	
		(0.0465)	
Max Relationship Lender			0.347**
			(0.184)
Max Relationship Lender*Crisis			0.655***
			(0.236)
Observations	70,748	70,748	70,748
Year	Crisis Dummy	Crisis Dummy	Crisis Dummy
Industries	Yes	Yes	Yes
Countries	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered
Pseudo R^2	0.2288	0.2413	0.1904
p-value (chi2)	0.00	0.00	0.00

Appendix A

TABLE A.I DESCRIPTION OF THE VARIABLES

Variable	Description
$X_{bond\ features}$	
Issue size	Natural logarithm of the bond proceeds
Maturity	Natural logarithm of bond's time to maturity in years
Callability	Dummy taking the value 1 if the bond includes a call option
Bond rating	Numerical ratings given by S&P to the bond at launch (AAA = 22 , Aaa = 21 , . . . , CCC+ or below =1)
Domestic placement	Dummy taking the value 1 if the bond is placed domestically
Market simultaneity	Continuous variable built adding all proceeds issued in the corporate bonds a time-window of 15 days considering the central point the issue date and taking logarithms.
Investment Grade	Dummy taking the value 1 if the bond is an investment grade bond
Purpose: Debt Repayment	Dummy taking the value 1 if the bond's purpose is to repay an outstanding debt
Fungible	Dummy taking the value 1 if the bond is fungible
Private placement	Dummy taking the value 1 if the bond is sold on a private placement
$X_{issuer\ features}$	
Issuer size	Natural logarithm of the issuer's total assets at the end of the year before the bond issue
Leverage	Ratio of total liabilities to equity at the end of the year before the bond issue
ROA	Return on assets based on the net incomes and total assets at the end of the year before the bond issue.
Finance vehicle	Dummy taking the value 1 if the issuer is a finance vehicle company
First-time issuer	Dummy taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years
Issuer rating	Numerical ratings given by S&P to the issuer at launch (AAA = 22 , Aaa = 21 , . . . , CCC+ or below =1)
$X_{syndicate\ features}$	
Nº Co-Managers	Number of co-managers taking this role in the deal
UW syndicate reputation	Average market share of the syndicate underwriters
UW syndicate size	Number of underwriters taking this role in the deal
$X_{underwriting\ features}$	
UW industry specialization	Industry Herfindhal index for each underwriter on the deal based on 2 digits SIC-industry codes
Shared nationality	Dummy taking the value 1 if the underwriter and the issuer are located in the same country
Top 7 Rep UW	Dummy taking the value 1 if the UW's market share is equal or higher than the market share held by the 7th underwriter in the annual league table
Ratio of Home UWs	Number of home-based underwriters (for issuers' perspective) in the deal to total number of underwriters in the deal
Relationships Variables	
UW previous co-manager	Dummy taking the value 1 if the issuer has appointed the underwriter(s) as co-manager in a previous bond issuance
UW previous bond UW	Dummy taking the value 1 if the underwriter(s) has underwritten a bond for the issuer in the last 2 years since the issuance date
UW previous lender	Dummy taking the value 1 if the underwriter(s) has underwritten a loan in a syndicate-loan for the issuer in the last 2 years since the date of issuance.
Relational HHI	Herfindahl index based on the market shares of all banks who led managed at least a loan for the issuer 2 years before the bond issuance
UW Mkt. Share	Proportion of the issuer's total bond proceeds issued for which the underwriter bank was appointed as Underwriter. The market share is computed splitting the bond size equally between all underwriters in multiple syndicated bonds.
Lender Mkt. Share	Proportion of the issuer's total loan proceeds for which the underwriter bank was appointed as Lender. The market share is computed splitting the loan value equally between all lender in multiple syndicated loans
Prior UW	Dummy taking the value 1 if the underwriter bank has taken the role of underwriter in a previous issuer's bond
Prior Lender	Dummy taking the value 1 if the underwriter bank has taken the role of Lender in a previous issuer's loan
Max. relationship UW	Dummy taking the value 1 if the underwriter for the issuer is the bank with the largest underwriter market shares. If the largest market share value is held by more than one underwriter, then neither of them is considered the max. relationship UW, and the dummy equals zero.
Max. relationship lender	Dummy taking the value 1 if the underwriter for the issuer is the bank with the largest lender market shares. If the largest market share value is held by more than one underwriter, then neither of them is considered the max. relationship lender, and the dummy equals zero.
UW latest Lender	Dummy taking the value 1 if the underwriter is the bank that granted the latest loan to the issuer (the most recent loan before the bond issuance)
UW latest bond UW	Dummy taking the value 1 if the underwriter is for the issuer the bank that took the role of underwriter in the latest bond issued by the firm (the most recent bond before the current bond issuance)
Time latest loan	Time, measured in days, elapsed between the latest loan granted to the issuer and the current bond issuance
Underwriter reputational distance	Underwriters' market share in the deal at year t minus the average underwriting market share at year t, divided by the standard deviation of underwriting market share at year t. $\frac{Mkt\ share_{i,t} - \overline{Mkt\ share_t}}{Standard\ Dev\ MS_t}$
Underwriter syndicated reputational ratio	Underwriters' market share in the deal at year t divided by the average underwriting market share in the syndicate j $\frac{Mkt\ share_{i,t}}{Syndicate\ Mkt\ share}$
UW relative bond weight	Total bonds' proceeds placed by the underwriter in the deal to total proceeds placed by the underwriter in the current month $\frac{Total\ proceeds_{i,h}}{Total\ proceeds_{i,h,m}}$
Relative pipeline	As Hu & Ritter (2007), $\frac{\frac{Nº\ bonds\ in\ process}{Total\ nº\ of\ bonds\ the\ UW\ has\ issued\ in\ year\ t}}{UW\ market\ share\ x\ Total\ Proceeds\ issued\ in\ all\ Fixed\ Corp.Bonds\ in\ year\ t}$

FIGURE A.I
EVOLUTION OF ISSUER-UW RELATIONSHIPS

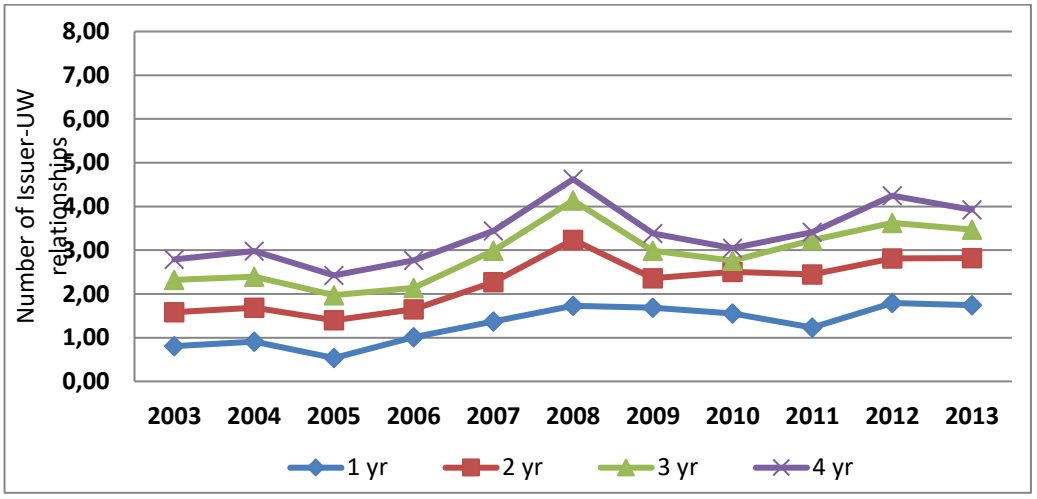


FIGURE A.II
EVOLUTION STRENGTH OF ISSUER-UW RELATIONSHIPS

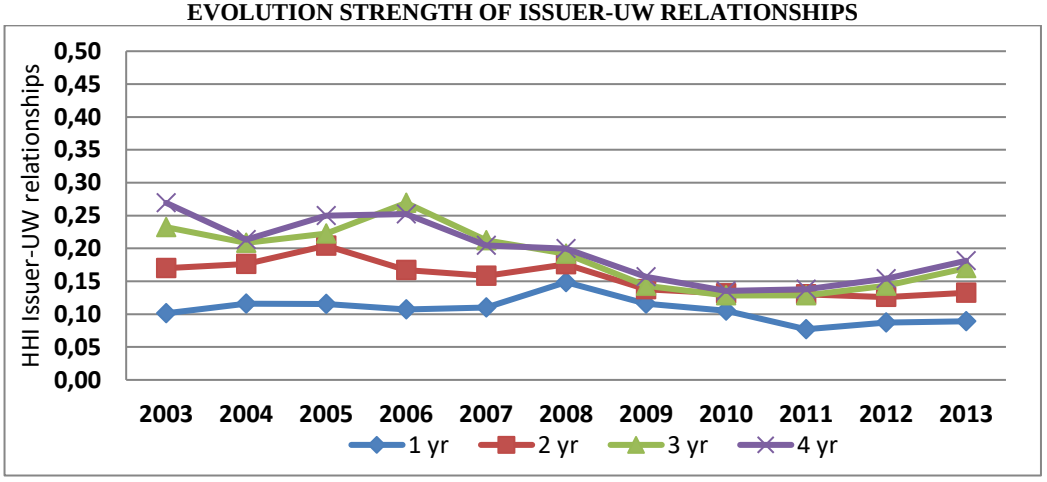


FIGURE A.III
SYNDICATE STANDARD DEVIATION

This figure uses cross medians syndicate standard deviation and then uses them as knots to fit a cubic spline. Standard deviation is computed using UWs' market shares.

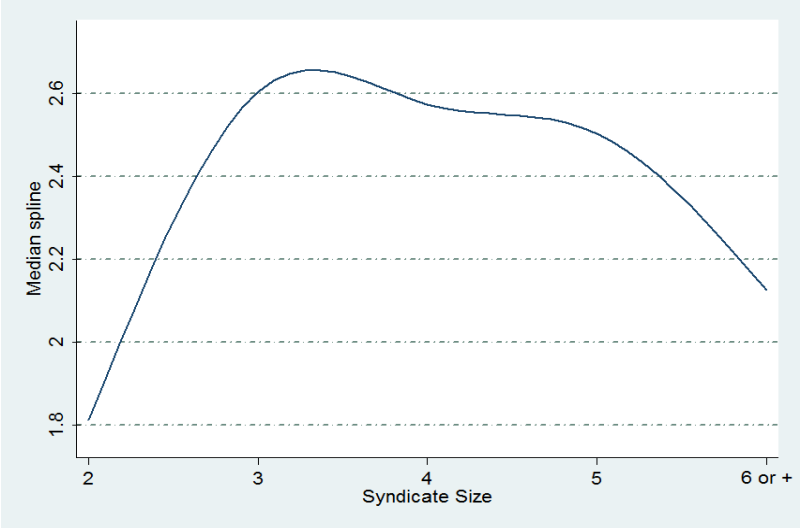
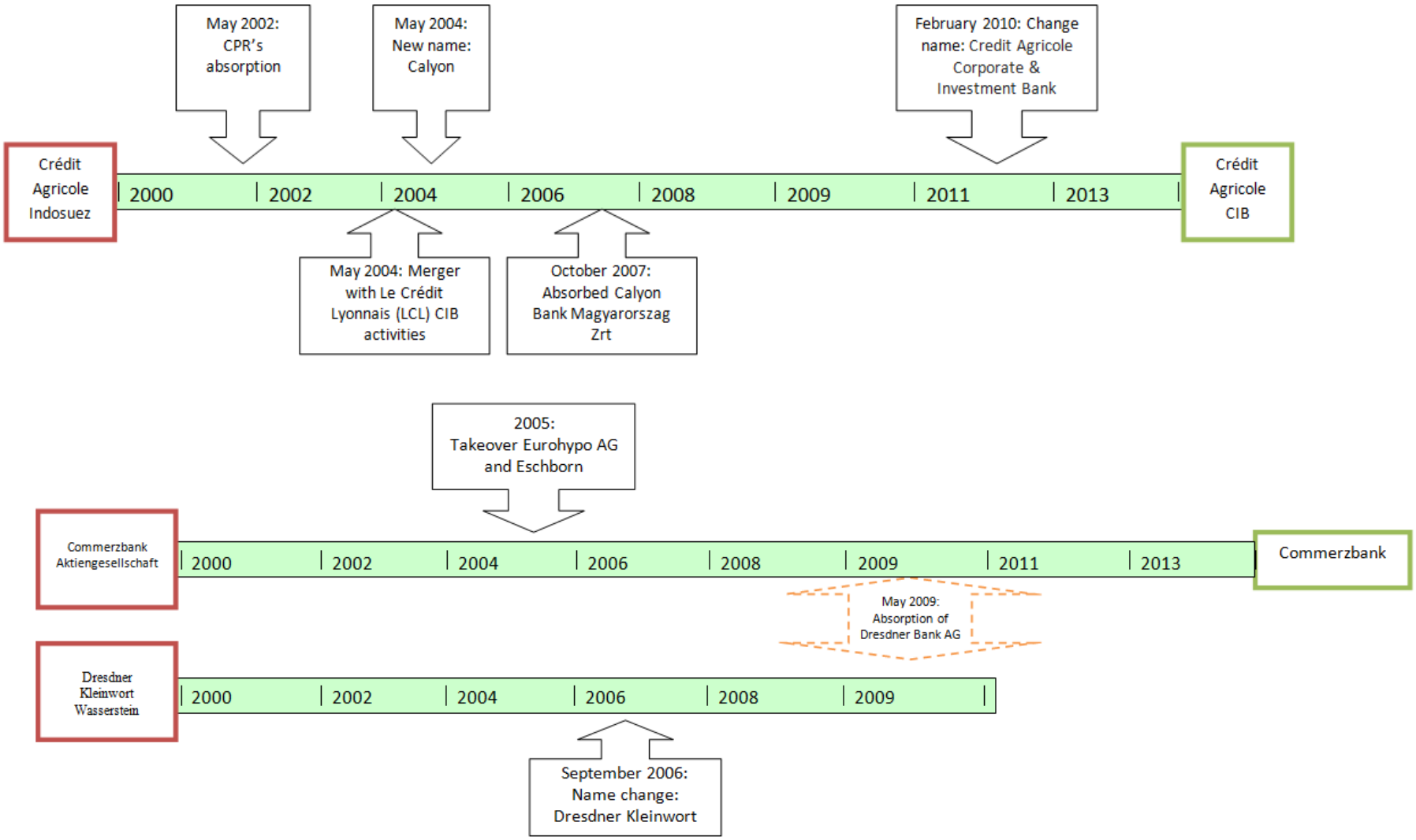


CHART A.I
CREDIT AGRICOLE CIB AND COMMERZBANK LIFETIMES



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