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ESSAYS ON UNDERWRITING AND REPUTATION

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To my grandmother Encarna,

"Todas las cruces son flores si las sabemos llevar.

Si os agobian soportadlas, que Jesús os sostendrá"

AUTORIZACIÓN PARA

LA PRESENTACIÓN DE LA TESIS

Dr. SANTIAGO CARBÓ VALVERDE, Catedrático de Fundamentos del Análisis Económico de la Bangor Business School y CUNEF, y **Dr. FRANCISCO RODRÍGUEZ FERNÁNDEZ**, Profesor Titular de Análisis de Fundamentos del Análisis Económico de la Universidad de Granada.

AUTORIZAN:

Como Directores de la Tesis y hasta donde su conocimiento alcanza que el trabajo ha sido realizado por el/la doctorando/a bajo su dirección y se han respetado los derechos de otros autores a ser citados, cuando se han utilizado sus resultados o publicaciones. Así mismo, el trabajo reúne todos los requisitos de contenido, teóricos y metodológicos para ser admitido a trámite, a su lectura y defensa pública, con el fin de obtener el referido Título de Doctor, y por lo tanto AUTORIZAN la presentación de la Tesis "*Essays on Underwriting and Reputation*" de la que es autor **D. PEDRO JESÚS CUADROS SOLAS** para su defensa y mantenimiento de acuerdo con lo previsto en el Real Decreto 99/2011, de 28 de enero.

Para que conste y surta los efectos oportunos firmamos la presente en Granada a 30 de Enero de 2017.

Dr. Santiago Carbó Valverde **Dr. Francisco Rodríguez Fernández**

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CHAPTER 1

General Introduction

1.1. General introduction

Financial markets exhibit asymmetric information problems between insiders and outsiders. Therefore, the intermediation role performed by specialized financial intermediaries in reducing these information asymmetries is essential for the soundness of the markets. Among all the market participants, the activity of banks and securities firms appointed as underwriters is particularly relevant. They perform a number of activities regarding the placement of the issues through a complex process that helps to mitigate the asymmetries in the financial markets.

The present doctoral thesis includes three research papers undertaken within the area of corporate finance. Its main purpose is to analyze the role played by these underwriters in capital markets to contribute to the knowledge on the relationship between underwriting and reputation in corporate bond markets.

1.1.1. The importance of the study of underwriting and corporate finance

Capital markets are an important source of funding for financial and non-financial corporations. Firms raise funds on these markets to finance their economic activity. Those financial institutions appointed as underwriters provide access to firms in these markets after subscribing to an underwriting contract. The role played by underwriters is justified by the presence of information asymmetries in the placement of the issues among investors. Issue placement is a lengthy and complex process involving several phases that might take around 7 weeks depending on several circumstances. During this process they perform research, information production, marketing, and market stabilization activities. Consequently, the final conditions obtained on the issuance depend to a great extent on the underwriter.

Additionally, the literature on capital raising argues that underwriters' reputation strengthens their role. Their reputation is valuable in reducing the information

asymmetries present in capital markets (Beatty & Ritter, 1986; Booth & Smith, 1986; Carter & Manaster, 1990; Chemmanur & Fulghieri, 1994). More reputable underwriters are able to solve the asymmetries more efficiently than less reputable ones. Therefore, reputable underwriters act as better certifiers of the value of the issue. Furthermore, the reputation acquisition process is generated in the capital markets when banks place deals in primary markets. This reputational concern justifies underwriters' avoidance of engaging in opportunistic behaviors when their reputation could be at risk. A large body of literature has underlined the existence of differential access when the underwriter is reputable (Burch, Nanda, & Warther, 2005; Carter, Dark, & Singh, 1998; Fang, 2005; Fernando et al., 2015; Fernando, May, & Megginson, 2012; McCahery & Schwienbacher, 2010; Neupane & Thapa, 2013).

Moreover, the literature on underwriting syndication has underlined how syndicate formation affects the functions of the syndicate, linking the syndicate's organizational structure with the central role of firms' relationships and reputation (Chen & Ritter, 2000; Corwin & Schultz, 2005; Ljungqvist, Marston, & Wilhelm, 2009; Narayanan, Rangan, & Rangan, 2004; Shivdasani & Song, 2011). In this sense, relationships among banks are critical in syndicate formation, because they help to mitigate free riding and moral hazard problems (Corwin & Schultz, 2005). Overall, firms' access to capital markets depends largely on the match between firms and underwriters and the way in which the underwriting syndicate is formed, since these aspects have an impact on the way in which information asymmetries are solved.

In addition, the relevance of the underwriting activity is justified by the large volume of money traded in the equity and debt markets. The annual volume of new issuance in capital markets is significant. Regarding equity markets, according to Dealogic, the international equity issuance (IPOs and SEOs) surpasses 1,000 billion

dollars annually, while new issuance in debt markets is around 10,000 billion dollars. Although financial institutions are legally allowed to place their deals by themselves, known as self-placements, the largest portion is underwritten by third parties.

1.1.2. Recent changes in underwriting

From the mid-2000s onwards, but especially after the turmoil, many changes have occurred in the underwriting industry that deserve special attention, since they could generate consequences worthy of further study. Firstly, the placement of issues in primary markets has changed from the "bought deal" to the "best effort." As a result, the issuer does not receive additional guarantees but the bank appointed as underwriter remains responsible for providing certification, screening, and marketing activities.

Furthermore, the recent change in the issuance offering, especially during the financial crisis, from a sole bank as underwriter to an underwriting syndication is particularly relevant. Nowadays, employing a syndicate of underwriters is the most common option. Lately, it has become even more usual to observe deals placed by large syndicates with around ten underwriters. In this sense, the average number of banks in the syndicate also increased to four underwriters per deal in 2013.

Additionally, the search for new profitable areas of business by commercial banks has reinforced their interest in providing these underwriting services alongside their traditional lending activities. It is worthwhile taking into account that underwriting is a particularly profitable activity for investment and commercial banks, as the income from fees is significant. Moreover, according to the new Basel regulation, underwriting is a capital-light activity. Hence, these two factors might explain the entry of traditional commercial banks into the underwriting industry.

It is also interesting to note the effect of the financial crisis on underwriting. In this sense, it is arguable that the recent turmoil might have had an impact on the distinctive

certification role played by reputable underwriters. Since during the crisis other reputational issues may have damaged their role as certifiers, this distinctive role is likely to be challenged.

On this point, after accounting for the relevance of the topic, this thesis aims to explore underwriters' role further, acknowledging the abovementioned recent changes in underwriting. In this sense, the first essay explores the issuer–reputable underwriter matching in corporate debt issuance by both banks and industrial companies, while in the third essay, with the aim of providing insights into the definition of a reputable underwriter, we investigate the evolution of underwriters' market share in corporate debt issuance. The second essay studies the underwriting syndicate, addressing the factors that determine the decision to appoint a syndicate and whether firms favor their relationship banks during the crisis by appointing them as underwriters. Taken together, the essays aim to provide insights into the role played by these underwriters providing access to firms in capital markets to contribute to the knowledge on the relationship between underwriting and reputation in corporate bond markets.

Finally, the expansion of the theoretical and applied literature concerning underwriting is reflected in the evolution of the papers published in recent years about this topic. In Figure 1.1. we present a simple bibliometric study on the articles published from 1975 to 2015 using the *Web of Science* as the main source. The search provides 1,367 published papers on "underwriting." As shown in Figure 1.1, the annual number of articles published presents a steady increase from 2000 onwards. Furthermore, most of these investigations have been published in top finance journals, like the *Journal of Finance*, *Journal of Financial Economics*, or *Review of Financial Studies*.

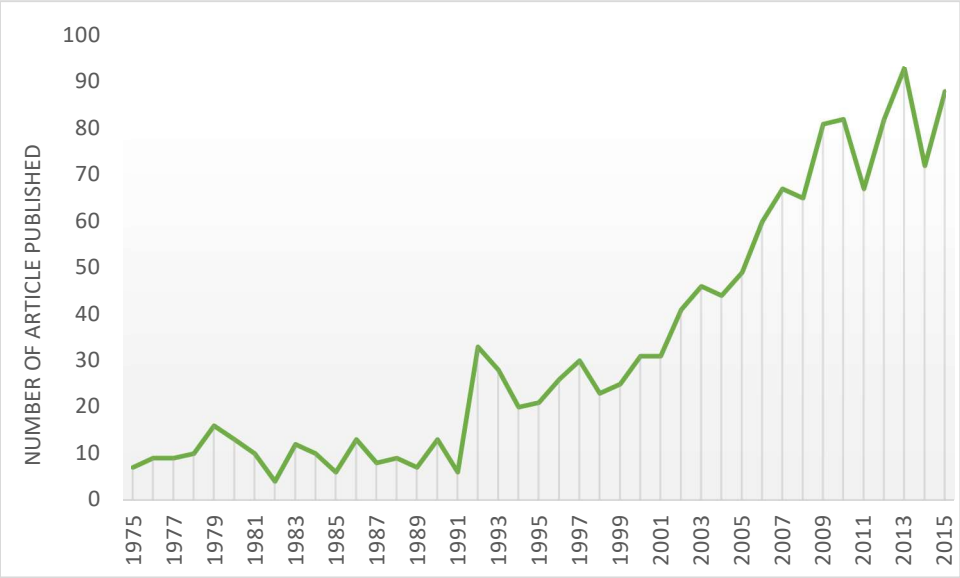

Figure 1.1.
Evolution on the articles published from 1975 to 2015 using the Web of Science

1.2. Contributions of the essays

This review introduces the studies included in this doctoral thesis by summarizing the main aspects of the research as well as outlining the leading contributions to the literature.

1.2.1. Do banks and industrial companies have equal access to reputable underwriters in debt markets?

This paper investigates, for the first time, the issuer–reputable underwriter matching in corporate debt issuance by both banks and industrial companies. We analyze whether banks and industrial companies have equal access to debt markets through reputable underwriters and explore the determinants of that matching for both types of firms. Using a sample of 3,687 European corporate bonds issued during the years 2003–2013, this essay investigates the access to debt markets through reputable underwriters.

Acknowledging that banks present particular features related to their financial intermediation activity compared with non-financial firms, the comparison makes sense

due to their shared motivation: being matched with a reputable underwriter. Consequently, our approach is based on examining banks as bond issuers in a reputable framework, so banks' self-placement deals are excluded to focus on third-party placements.

From a methodological perspective, as in other studies, this paper uses the market share as a proxy for underwriter reputation, but we account for the growing proportion of syndicate-placed bonds by measuring reputation using a new measure that accurately reflects whether a bond is reputably placed in syndicate-placed bonds.

The contribution of this paper is threefold. First, we examine, for the first time, the issuer–reputable underwriter matching for banks considering their distinctive features compared with non-financial issuers. Secondly, we provide evidence of a lower probability of matching with a reputable underwriter for banks, especially during the subprime and banking crisis. However, before the crisis no differences are found in the access of banks and non-financial companies to reputable underwriters. Lastly, we show differing relevance of bond and issuer size to the matching; we find a greater effect of bond size for non-financial companies, while bank size is relatively more decisive for banks.

Our results suggest the need for further research on information asymmetries' effect on banks as clients of underwriting services. Furthermore, the larger difficulties for banks in matching with a reputable underwriter could be removed by implementing policies that favor the consolidation of these markets in Europe.

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

In Chapter 3 we investigate the underwriting syndication trend, since the latest market developments, especially after the onset of the financial crisis, reveal that deals

are placed by syndicates that have increased in size in recent years. While the industry has explained the phenomenon as a consequence of the effect of prior relationships on the underwriting choice during the financial crisis, the evidence is still relatively sparse. In this essay we aim to connect the academic literature on syndicate underwriting with the feelings that exist in the industry. In doing so, we take into consideration the effects that relationships have on underwriting syndication and issuer–underwriter matching. Then, this study explores syndicates further, addressing the questions of which factors determine the decision to appoint a syndicate and whether firms favor their existing relationships when appointing their deals' underwriters. Our analysis relies on a unique database that contains detailed information about bonds' issuers, syndicates, and issuer–underwriter lending relationships in the European corporate markets before and during the crisis.

The contribution of this paper is twofold. First, our analysis contributes to the extant literature on issuer–underwriter matching by explaining how issuers' relationships influence the decision on whether to syndicate the issuance or remain with a sole underwriter as well as on the structure of the syndicate formation. Additionally, this essay explores how the concentration of these relationships affects the underwriting choice before and during the crisis. Then, we find evidence on the existence of reputational concerns in the syndicate formation, since reputable underwriters are less likely to join a syndicate if their counterparts are underwriters with a low reputation.

The evidence suggests that prior lending relationships have a significant impact on the syndicate choice and that this effect is particularly significant during the crisis. These results confirm the industry claims as well as suggesting that the strengthened effect of lending relationships on underwriter choice is likely to explain the multiple-underwriting phenomenon. We also find that reputable banks refrain from joining a

syndicate if they perceive that they are matching with less reputable counterparts. Finally, after accounting for selection bias, we show a negative relationship between those factors that favor the syndication choice and bond spreads during the crisis.

1.2.3. Non-pricing drivers of underwriters' reputation in corporate bond markets during the crisis

Closely related to the abovementioned essays, in the fourth chapter we explore the effects of pricing and non-pricing competitive factors on banks' reputation as underwriters in corporate bond markets. While a number of studies have explored the role of reputation using market share as proxy, evidence that shows which factors determine underwriters' market shares is still lacking. Additionally, the recent growth of bank bond markets around the time of the crisis allows us to explore banks' reputation in these markets for recipients of state aid recapitalization measures

After providing evidence of a non-fragmented European underwriting industry for corporate bonds, our panel of 121 underwriters in the European debt markets from 2007 to 2013 allows us to explore how market shares evolve. Regarding the bailing-out measures, they were adopted by different national governments and supranational institutions based on their competencies, so the data on these measures are dispersed. Thus, we hand-collected data from our sample underwriters from several public sources (the European Commission, U.S. Department of the Treasury, Swiss National Bank, central banks, governments, banks' websites, treasuries, and restructuring agencies). As in other empirical studies, we consider that a bank has been recapitalized if it has received an injection, whatever the instrument or program, but that it is considered as eligible Core Tier 1 Capital. As a result, from 2006 to 2013 we report 64 recapitalization measures concerning 36 banks with a total amount of over 350 billion euros.

This paper contributes to the literature on reputation by studying the relative impact of pricing and non-pricing factors on underwriting market shares. Along with the usual pricing variables (fees, yields), we include a number of non-pricing factors, including the presence of star analysts in the underwriting team, as well as the joint provision of lending and underwriting services. Furthermore, we provide novel evidence on the effects of recapitalization measures on underwriters. Specifically, we find that : i) the market share of reputable banks decreases after receiving state recapitalization aid (by 22.6%); and ii) non-reputable recapitalized banks increased their market shares relative to non-reputable recapitalized banks by (63.6%).

Controlling for several factors, our results suggest that underwriters' market shares in Europe are not driven by a competition based on fees or bond pricing. We find that providing joint lending and underwriting services besides offering research coverage by a reputable analyst serves to attract business. Moreover, our results are line with the reputational hypothesis; those reputable banks that were recapitalized decreased their underwriting market shares while non-reputable banks increased them after being recapitalized.

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CHAPTER 2

Do banks and industrial companies have equal access to reputable underwriters in debt markets?

Abstract:

We analyze whether banks and industrial companies have equal access to debt markets through reputable underwriters and explore the determinants of that matching for both types of firms. Using a sample of European corporate bonds during the years 2003-2013, we find that the odds of matching with a reputable underwriter were about 1.5 times greater for non-financial companies than for banks. The odds of matching with a reputable underwriter were 10.92 times lower for a bank during the crisis. As for the determinants of the matching probability, the marginal effect of the bond size on the matching probability is 1.70 larger for non-financial firms than for banks. Furthermore, the effect of bond size is greater for large non-financial companies than for large banks while the effect of maturity is larger for banks than for non-financial companies.

Keywords: Underwriter reputation, corporate bonds, asymmetries, banks, underwriting

JEL Classification: G32, G21

2.1. Introduction

The success of a debt issuance offering depends largely on the ability to solve information asymmetries in the placement of the issues among investors. This process comprises issuers, banks and investors, and goes further than a selling mechanism. Investment and commercial banks appointed as underwriters perform research, information production, marketing and market stabilization activities, among others.[1]

A large body of literature highlights the relevance of underwriter reputation on capital and debt raising, arguing that the reputation of financial intermediaries is able to reduce the asymmetric information problems between issuers and investors (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994). It has been shown that a reputation acquisition process is generated in the capital markets when banks place deals into primary markets. Underwriters are concerned about maintaining their reputation because reputation acts as a signal in the market. In this sense, Fang (2005) empirically finds that reputable banks obtain higher prices (lower yields) for their issuers, concluding that reputable underwriters are able to offer their clients services of superior quality. In a similar vein, Neupane and Thapa (2013) analyze the investor–underwriter relationship and show that prestigious underwriters hold strong relations with institutional investors. Issuers aim to match with a reputable underwriter and underwriters want to place issues from high-quality issuers. A number of studies have agreed on reputation being determinant in the matching for one

[1] The placement of debt issues in primary markets has changed from the "bought deal" to "best effort". In the "bought deal" method, the bank in charge of the placement commits to buy the bond to afterwards resell it. This method provides greater guarantees to the issuer but it adds risk to the bank. The "bought deal" method has progressively lost ground. During 2003 – 2013 Dealogic reports that 94% of the corporate bonds placed in Europe were made on a "best effort" basis. With this method, no additional guarantees are provided to the issuer but the bank in charge of the placement does not act as a mere distributor because it also provides certification, screening and marketing. When the "bought deal" was the preferred choice in debt markets, the bank in charge of the placement was referred to as "underwriter". When the placement is made on a "best effort" basis the bank managing the placement is the "bookrunner". Currently, the expression "lead underwriter" and "underwriter" are used indistinctly in the U.S., whereas in London "underwriter" continues to be used, although the method chosen is "at the best efforts". For comparative purposes and given its extensive usage, we will refer to debt placement as underwriting.

of the sides (Benveniste et al., 2003; Drucker and Puri, 2005; Hoberg, 2007; Kanatas and Qi, 2003; Ljungqvist et al., 2006; Yasuda, 2007), or both sides jointly (Fernando et al,. 2015; Fernando et al., 2012).

Fernando et al. (2005) argue that reputation explains the decision to switch underwriters from past issues, and Fernando et al., (2015) show that there exists a positive assortative matching between issuers and underwriters. Additionally, most empirical studies identify deal size and issuer size as key factors in the likelihood of matching a reputable underwriter (Andres et al., 2014; Cao et al., 2014; Dong et al., 2011; Fang, 2005; Fernando et al., 2005; Lee and Masulis, 2011; Loureiro, 2010; Neupane and Thapa, 2013).

While a number of prior studies have been devoted to assessing the issuer-underwriter reputational matching and its main determinants in non-financial deals, the evidence is still relatively sparse, and mostly confined to equity issues in the U.S. capital markets. This paper offers a wide view of debt markets and investigates the issuer-reputable underwriter matching process in corporate debt issuance by both banks and industrial companies. We address the question of whether banks and industrial companies have equal access to debt markets through reputable underwriters. The distinction between banks and non-bank companies in this context is related to the particular features of the financial intermediation activity of the former. A large body of literature has underlined banks' ability to produce and handle information in the markets (Allen and Faulhaber, 1988; Allen and Gale, 1997; Baron, 1982; Booth and Smith, 1986; Dewatripont and Maskin, 1995; Diamond, 1984, 1991; Grinblatt and Hwang, 1989; Leland and Pyle, 1977; Welch, 1989). Based on theoretical assumptions on the informational differences between banks and non-financial firms, it seems reasonable to

explore whether these differences also appear in their access to markets where only banks can act as underwriters.

As being matched with a reputable underwriter determines the final conditions obtained on the issuance, a differential access to a reputable underwriter is a matter of importance. Both banks and industrial firms would in principle prefer matching a reputable underwriter. Therefore, after controlling for bond and issuer factors, a differentiated access would suggest that the information gathered by banks through their intermediation activities help them obtain better conditions compared with non-financial firms when they issue comparable bonds.

Nevertheless, the view that banks enjoy information advantages in debt markets could be challenged since the perceived quality of the distinctive certification role of banks may change over time: for example, when other reputational issues affect the certification value, as happened during the financial crisis.

Another natural and distinctive feature is that banks may act as issuers and/or underwriters, while non-financial firms only act as issuers. Banks also have the option of self-issue vs. using third-party underwriters. This array of options introduces the possibility of some strategic behavior within the banking industry. In particular, some banks could exert some leadership in any of the two roles or both of them (underwriters and/or issuers). For example, if investors perceive that underwriters are more prone to place certain bonds compared with other similar ones, their appetite is likely to be affected. Additionally, some strategic relationships can be built over the course of the matching of underwriters and issuers that may affect the way some banks issue debt over time.

Our analysis relies on a sample of 3,687 corporate bonds issued during 2003-2013. Furthermore, we aim to complement a strand of the literature that has investigated the

determinants of reputable matching by empirically quantifying their effect in order to address what terms of the bond structure and issuer characteristics are the most relevant. From a methodological perspective, as in other studies, we use the market share as a proxy for underwriter reputation. However, we take into consideration the growing proportion of syndicate-placed bonds[2] and build a new measure that more accurately reflects whether a bond is reputably placed in a syndicate-placed issue.

The empirical analysis comprises two main stages. In the first stage, we use multivariate logit models to compare the likelihood of non-financial companies and banks matching with a reputable underwriter. In the second stage, we analyze and quantify the determinants of the matching using logit regressions, and compute their marginal effects.

By way of preview, we find that the odds of issuing a bond placed by a reputable underwriter were about 1.5 times greater for non-financial companies than for banks in Europe during the years 2003-2013. Banks and non-financial companies did not have a different likelihood of accessing a reputable underwriter in the pre-crisis years. However, a lower likelihood of matching a reputable underwriter was observed for banks during the subprime period and particularly, the banking crisis period. In particular, the odds of matching with a reputable underwriter were 4.32 and 10.92 times lower for banks, respectively. Regarding bond and issuers' characteristics, we find that bond size was statistically and economically a more relevant factor for non-financial companies while issuer size was relatively more relevant for banks. The marginal effect of the bond size on the probability of accessing a reputable underwriter was 1.70 larger for non-financial firms than for banks. However, the relative weight of issuer size in terms of the marginal effect of bond size is larger for banks than for non-financial firms. Furthermore, the effect

[2] Before the year 2000, the average number of underwriters placing a bond in Europe was close to 1. Since the beginning of the century this mean has been increasing, which is also confirmed considering the median. Since 2008 the average has surpassed 3 underwriters per deal for industrial corporate bonds.

of bond size on the matching probability is greater for large non-financial companies than for large banks, while the effect of maturity on the matching probability is greater for banks than for non-financial companies, this difference increasing as maturity does.

The remainder of the paper is organized as follows. Section 2 reviews the extant literature. Section 3 develops a theory discussion on banks in debt markets. Section 4 describes the dataset. The methodology is explained in Section 5. Section 6 discusses the main empirical results. Section 7 concludes.

2.2. Related literature

One strand of the finance literature has linked the functions performed by financial intermediaries in capital markets to its reputation. Traditionally, researchers have highlighted the certification role performed by underwriters in equity and debts issues, backing the so-called "certification hypothesis". This hypothesis argues that underwriters have the skill of reducing information asymmetries through their own reputation. Booth and Smith (1986) show that opportunist behavior can potentially arise by insiders possessing extra information about the issue and that underwriter reputation is a mechanism for preventing this behavior. Beatty and Ritter (1986) argue that the certification role is enforced when reputation is at stake because banks do not have incentives to cheat. According to this role, when underwriters price issues in the capital markets they do so certifying issuers. Underwriters have incentives to maintain their reputational capital as bad future performance can damage their reputation, negatively affecting their business volume. Lead underwriters are concerned to maintain their reputation, and reputation acts as a signal for the market (Carter and Manaster, 1990). The reputational capital of these banks explains why they certify the intrinsic value of the issue. In this sense, Chemmanur and Fulghieri (1994) point out that reputable underwriters reduce the information asymmetries present in financial markets more

effectively because they implement standards to evaluate issuers in order to reduce the likelihood of poor performances in the future.

These theoretical predictions have been confirmed to some extent in empirical studies examining equity IPOs and corporate bond issuance. Dong et al. (2011) use a sample of 7,407 IPOs from 1980 to 2006 to show that deals placed by reputable underwriters predict a better long-run performance. Besides, IPOs with higher underwriter reputation are shown to outperform IPOs with less reputable underwriters. Using a sample of 2,449 industrial bonds, Livingston and Miller (2000) conclude that reputation certifies the value of a bond issue to investors.

In the most specific study on debt issues, Fang (2005) provides empirical evidence on certification. Reputable underwriters are found to obtain higher prices (lower yields) for their issuers.

More recently, some studies have suggested a shift from the certification role to a "market power hypothesis". Chemmanur and Krishnan (2012) maintain that, as highly reputable underwriters with larger market shares are capable of attracting large institutional investors, they have the incentive to maximize the issue valuation instead of certifying its intrinsic value. In particular, they show that IPOs placed by more reputable underwriters are priced higher than their intrinsic values. Andres et al., (2014) provide evidence of higher downgrade and default risk in high-yield bonds placed by reputable underwriters.

The extant studies that have used a matching model to study the issuer-underwriter relationship have chiefly contemplated the underwriter's reputation – as well as the existence of previous and concurrent credit relationships – as driving forces of choice. In this context, the general conclusion is that previous credit relationships positively affect the probability of being chosen as underwriter in future issues because the establishment

of a relationship allows the underwriter bank to generate a valuable asset that is referred to as "relationship specific capital" (Bharath et al., 2007; Drucker and Puri, 2005; Duarte-Silva, 2010; G. Kanatas and Qi, 1998; Ljungqvis et al., 2006).

Traditionally, the models used have been solely based on the choice made by one of the counterparts (Drucker and Puri, 2005; Hoberg, 2007; Ljungqvist et al., 2006; Yasuda, 2005, 2007). In these models, the issuer chooses from among a range of underwriters that are willing to place the issue. However, Fernando et al. (2005) consider matching a mutual choice. In their model, the underwriter screens the issuer's quality and at the same the issuer tries to identify the ability of the underwriter to place the issue. As a result of the mutual screening there is a positive assortative selection in which high-quality issuers match with reputable underwriters induced by reputation. Furthermore, the probability of the continuity of this selection decreases as the difference between issuer quality and underwriter reputation increases.

This positive assortative selection leads us to consider not just a simple issuer-underwriter matching but a reputable matching. Generally, this strand of literature has provided empirical evidence on the (deal-level and issuer-level) determinants of the reputable matching, highlighting that deal size and issuer size are particularly relevant (Andres et al., 2014; Cao et al., 2014; Dong et al., 2011; Fang, 2005; Fernando et al. 2005;Lee and Masulis, 2011; Loureiro, 2010; Neupane and Thapa, 2013). To the best of our knowledge, there is no empirical evidence about these determinants for banking corporate bonds.

Consistent with the role of reputation in the matching models, a number of studies have tried to explain what triggers the changing of underwriters for subsequent offerings as switching models. Krigman et al. (2001) study the reasons that lead issuers to switch to a new underwriter in successive equity issues, concluding that issuers do not change

because they are displeased with a past issue's features. Rather, they seek reputable underwriters able to offer them a better quality service ("graduation hypothesis"). Fernando et al. (2005) show that firms will be more likely to switch underwriter as the difference between the new issuer's reputation and the reputation of the previous underwriter increases, confirming the positive assortative matching ("transaction-based hypothesis"). McKenzie and Takaoka (2013) find that the issuer and the most recent lead underwriter's reputation – along with issuers' current relationships – affect the switching choice in the Japanese bond market.

Another set of studies has further examined the ex-post value that arises from engaging with a reputable bank in an attempt to explain why issuers prefer highly reputable underwriters. This preference is likely to be explained by the better long-run performance of those issuers that raise capital though prestigious underwriters (Carter et al., 1998; Dong et al., 2011). Furthermore, Neupane and Thapa (2013) show that prestigious underwriters hold strong relations with institutional investors while less prestigious underwriters mainly deal with non-institutional investors. Burch et al., (2005) conclude that there is created value for those companies matched with reputable underwriters, although it depends on the type of issuance, while Fernando et al., (2012) highlight that the created value for firms is higher if the underwriter helps them to go public compared to issuing debt securities.

2.3. What makes banks special?

2.3.1. Banks in debt markets

Some theoretical contributions illustrate why the distinction between the matching probability of banks and non-banks matters. Despite the fact that differences between

banks and non-financial firms have been widely examined in the finance literature, we focus on the differences in their role as corporate bond issuers.

Seminal theoretical contributions to debt markets depict a situation in which a bank, acting as an underwriter, is better informed than the issuer (Allen and Faulhaber, 1988; Baron, 1982; Grinblatt and Hwang, 1989; Rock, 1986; Welch, 1989). Fama (1985) highlights this role arguing that banks have a competitive advantage due to their ability to process information. Banks have been shown to be specialized financial intermediaries that are able to certify issuers' quality in the presence of information asymmetries (Booth and Smith, 1986; Chemmanur and Fulghieri, 1994) because they produce information as market participants. Non-financial firms do not have this ability. Furthermore, even assuming a certifying ability of non-financial firms, only financial institutions are legally allowed to provide underwriting services in capital markets and, therefore, they can benefit from day-to-day market participation informational benefits.

Traditionally, large investment banks dominated the underwriting industry. However this prevalence recently changed with the entry of mid-tier commercial banks in Europe (Migliorati and Vismara, 2014) and the United States (Shivdasani and Song, 2011). The search for new profitable areas has made the provision of underwriting services an attractive line of business. The double role that banks can play in the markets as both issuers (clients of underwriting services) and underwriters (suppliers of underwriting services) is likely to generate differences when they issue compared to non-financial firms due to a better knowledge of the market and its rules.

This informational advantage that is stressed in the theoretical literature would predict an enhanced access to these markets for banks compared to non-financial firms. However, the advantages of this apparently superior role of banks as information producers have also been challenged. In this sense, the distinctive certification role of

banks may change over time when other reputational issues affect the certification value, as happened during the financial crisis. A body of literature has argued that, relative to non-financial firms, banks are more opaque (Hirtle, 2006; Morgan, 2002). However, Flannery et al., (2013) contextualize banks' opaqueness to crisis periods. They conclude that banks are not more opaque in normal periods, they are more opaque only during crises, which might imply that certifying a bank bond may entail more complexity than doing so for firms from other industries.

Other studies suggest that since underwriters of bank debt undertake a peer assessment, the knowledge of their own industry may overcome the negative effects of opaqueness. Dinger and Von Hagen (2009) find evidence in favor of the argument that banks are quite good at identifying the risks of other banks.

Underwriters are putting their reputation as certifiers at stake. They are fully aware that a future bad performance would negatively affect their reputation. Therefore, if they perceive that the issuer bank is opaque or cannot be properly assessed, they will have incentives to reject an underwriting mandate. Furthermore, as the issuer bank and the underwriter are likely to compete in the underwriting industry, it is even less rational to share reputational problems with rivals. This reputation acquisition mechanism may push some banks to opt for self-issuing their securities. This identification problem is avoided in our paper with the exclusion of self-funded bank bonds. We are interested in the matching between a bank issuer and a third-party underwriter.

There are also some relevant lessons from the related literature on the syndicate loan market and the interbank market that acknowledge the relevance of relationships in the reputation building process. Sufi (2007) explores the syndicate loan market and finds that issuers that have repeated access to the market face fewer information asymmetries – because lead arrangers should hold less of the loan. Similarly, Cocco et al., (2009) also

find that relationships are an important determinant of banks' access to the interbank market. These relationships have been found to explain, to a large extent, the growth of syndication in loan and bond markets (Chuluun, 2015; Corwin and Stegemoller, 2014; Hu and Ritter, 2007; Jeon, et al., 2015; Shivdasani and Song; 2011)

The regulation imposed on banks may also imply some distinctive features in the bond issuer-underwriter matching compared to non-financial companies. Some recent contributions suggest there are links between regulation and information disclosure by banks. Using data from 65 European banks, Toader (2015) confirms that post-crisis bank regulation has contributed to reducing information asymmetries and bank funding costs. Similarly, Petrella and Resti (2013) find that the disclosure of European stress tests made some valuable information emerge and reduced banks' opacity.

Overall, therefore, while the superior informational advantage of banks would normally predict enhanced access to these markets for them, this may not happen when their certification role is damaged, particularly when banks' opaqueness and uncertainty appear in periods of financial turmoil.

Acknowledging that banks present some peculiarities compared to non-financial firms leads to the question of why it makes sense to compare both types of firms in this issuer-underwriting context. The main reason lies in their shared motivation: being matched with a reputable underwriter. Banks and industrial firms recognize that underwriter reputation matters in capital markets, and they both aim for their corporate bonds to be placed by reputable underwriters. Our approach is based on examining them as bond issuers in a reputable framework, excluding banks' self-issued deals in order to focus on third-party placements. For comparability reasons, we employ fixed corporate bonds, sold in the same primary markets but issued by banks or non-financial firms.

2.3.2. The determinants of the matching probability

While prior literature finds evidence on the main matching determinants for non-financial deals, there is a lack of evidence on bank bonds. Given the abovementioned differences between non-financial firms and banks, our baseline hypothesis would be that the specific information advantages attached to the financial intermediation and market underwriting participation of banks confer them advantages in accessing reputable underwriters.

In trying to explore these informational advantages, we follow earlier studies and make a distinction between deal-level characteristics and issuer-level characteristics. Theoretical and empirical investigations on equity and debt issues, summarized in Table 2.5., have yielded some relevant evidence that we discuss in the following sub-sections.

2.3.2.1. Bond-level determinants: Placement complexity

Some studies suggest that specific features of bond placement may increase or decrease the likelihood of matching a reputable underwriter. We focus on the main features of the design – volume of the proceeds raised and bond maturity – as proxies of placement complexity (Fang, 2005; Fernando et al., 2015; Lou and Vasvari, 2013; Song, 2004) . Prior studies show that more complex bonds are more likely to be placed by reputable underwriters (Andres et al., 2014; Fernando et al., 2015; Loureiro, 2010; McKenzie and Takaoka, 2013). Higher investor demand for reputable players coupled with higher capabilities in the development of these activities, lead issuers to choose more reputable underwriters when they want to place complex bonds (Chemmanur and Krishnan, 2012; Neupane and Thapa, 2013). In particular, placement complexity increases with bond size as underwriters must exert greater effort in marketing, pricing and selling. Additionally, the relationship between maturity and risk means that long-term bonds entail higher complexity on being brought to market. Hence, bonds aiming at large proceeds and with longer maturities are considered more complex to underwrite.

Although some empirical studies have considered that callability might be related to placement complexity (Fang, 2005; Livingston, and Miller, 2000) due to the reinvestment risk for bond buyers, the decision to include a call option is also related to information asymmetries (Banko and Zhou, 2010; Z. Chen et al., 2010; Choi et al., 2013; Robbins and Schatzberg, 1986). Signaling theory highlights that including a call feature serves as a signal of issuers' quality in the presence of asymmetric information. Furthermore, Fernando et al., (2005) consider the existence of a positive qualitative matching between issuers and underwriters. Consequently, the relationship between callabillity and the reputable matching is not necessarily explained by complexity. Information asymmetries could bias the choice of issuing these bonds.

2.3.2.2. Issuer-level determinants: First-time issuer

Supporting the certification hypothesis, prior studies find that issuers' opaqueness is negatively related to the probability of a reputable matching (Andres, et al., 2014; Cao et al., 2014; Fang, 2005; Fernando et al., 2005; Yasuda, 2005)**.** Reputable underwriters are less likely to place a bond of an opaque issuer, thus putting their reputation at stake. Lack of experience issuing debt securities increases uncertainty about the bond issuer.

In financial markets, intermediaries are supposed to be better informed than non-financial intermediaries due to their ability to produce information as market participants (Allen and Faulhaber, 1988; Baron, 1982; Grinblatt and Hwang, 1989; Rock, 1986; Welch, 1989). Additionally, as shown by Holod and Peek (2007), banks are subject to more stringent information disclosure, and more intense research coverage by investors, financial analysts and rating agencies, thereby contributing to a reduction in information asymmetries for them. Consequently, we would expect the probability of matching a reputable underwriter to be more negatively affected by informational asymmetries in the case of non-financial firms. Similarly to Andres et al. (2014) and Gande et al., (1999), we

employ the dummy variable "first-time issuer" that takes the value 1 if the issuer had not issued any corporate bond over the last 15 years (from 1988) before the sample begins in order to explore this hypothesis.

Along with experience, other concurrent performance indicators should be considered to compare the reputable matching probability of banks and non-financial firms. One might argue that banks are subject to greater regulatory scrutiny but, in fact, market discipline applies for both types of issuers. Besides, any differences in the effects of performance or solvency indicators may reveal some institutional advantage (due to regulatory or market differences), which is worth investigating in any case. Issuers' leverage, ROA and total assets are included to control for the level of indebtedness, profitability and issuer size (as in, for example, (Cao et al., 2014; Fang, 2005; Fernando et al., 2005; Fernando et al., 2015; Lou and Vasvari, 2013; Loureiro, 2010).

2.4. Data and descriptive Statistics

2.4.1. Measuring underwriter reputation

Some previous studies measure reputation by looking at the position that the underwriter has in the tombstone announcement that goes with an issue (Burch et al., 2005; R. Carter and Manaster, 1990; Kirkulak and Davis, 2005; Logue et al., 2002; Suzuki, 2010). The rationale behind this way of accounting for reputation is that underwriting banks are not placed in random positions but strategically to signal reputation. However, the difficulty that is entailed in collecting these tombstones for corporate bonds and the diminishing volume of them have played against their use as an indicator of reputation.

There are also measures based on market opinion surveys. According to Roden and Bassler (1996), market opinions do not necessarily provide better reputation measures than tombstone-based indicators.

Most of the literature has considered that market share is an accurate proxy for reputation in the underwriting business. Highly reputable underwriters should be those with greater market shares because reputation attracts more underwriting contracts. Two main measures have been built from market share information: cardinal and ordinal. A cardinal measure considers the market share as a continuous variable (Esho et al., 2006; Gande et al., 1997; Iannotta and Navone, 2008; Livingston and Miller, 2000; Megginson and Weiss, 1991; Roten and Mullineaux, 2002; Schenone, 2004) Alternatively, ordinal measures classify or rank underwriters according to their market share, considering only the top underwriters as reputable (Andres et al., 2014; Esho et al., 2006; Fang, 2005; Livingston and Miller, 2000; McCahery and Schwienbacher, 2010; R. P. Narayanan et al., 2006; R P. Narayanan et al., 2004; Ross, 2010; Yasuda, 2005).

We opt for an ordinal measure. As Fang (2005) argues, this way the market structure is encompassed best because banks in capital markets are commonly seen either as heavyweight players or not. We consider as reputable those underwriters ranked in the top 7 in the annual underwriter leagues, as shown in Tables 2.1. and 2.2. using the rankings of Dealogic Debt Capital Markets[3]. The cut is not arbitrary but motivated by several reasons. The European fixed corporate bond market is less concentrated than that of the United States. The top-3 ranking is mostly used in the U.S. but in Europe there are no big differences in terms of market shares between the first-ranked banks in the

[3] Leagues have been built using as deal underwriters those considered as underwriter parents. Our rationale for considering underwriter parents is that debt financial markets are dominated by large banks. Although their subsidiaries sometimes carry out underwriting services, the esteem and reputation that influence the matching and signal quality arise from the parent bank that backs the subsidiary. As per Kollo (2005), taking underwriter parents reflects the multinational nature of the market. However, for purposes of robustness we have also built reputation measures using league tables by underwriter subsidiaries.

underwriter league tables[4]. Furthermore, during the period covered, the seventh underwriter annually presented a market share of around 5%, whereas the eighth fell quite below this share. In addition to this, the top 7 underwriters participated annually, as sole underwriter or in a syndicate, in more than 50% of deals[5]. One possible option could have been to select the main seven banks as reputable, as in Fang (2005). However, some underwriters that were reputable in the debt markets at the beginning of the sample period were not at the end.

Sole underwriter deals are easy to classify using the league tables but when a syndicate has placed the bond, there are different alternatives. Traditionally, those who have discretized the market share have considered a deal as reputably underwritten if at least one of the underwriters is at the top of the selected ranking (Andres et al., 2014; Cao et al., 2014; Fang, 2005; Fernando et al., 2005). As syndicate deals are common in Europe, the chance of considering a bond as reputably underwritten following such a criterion increases. It is highly likely that bonds with more underwriters will be considered reputable if just one of those underwriters is reputable. A much stricter option is to consider a deal as reputable only if all underwriters in the syndicate belong to the top 7. However, using this criterion a syndicated deal can be considered as not reputable just because one underwriter is not in the top 7 even if the rest of them are. We opt for a more balanced option. We compute the market share that the syndicate would have had if all the banks participating in it had merged. We refer to this indicator as the "Syndicate Market Share" (SMK). A deal is considered as reputable if the average SMK is higher than the market share held by the seventh underwriter in the annual league tables. This

[4] The similar market share covered by the top 3 underwriters reported in Andres et al. (2014) for high-yield corporate bonds in the United States and for the top 7 in the European market – 39.3% for the top 3 in the United States and 43.17% for the top 7 in Europe – suggests that extending the reputation some places is a need not a whim.

[5] This group is basically formed by Deutsche Bank, RBS, JPMorgan, Citi, BNP Paribas, HSBC and Barclays. Only three banks other than the ones cited – SG Corporate & Investment Banking, Credit Suisse and Bank of America Merrill Lynch – have entered this group in recent years.

also solves to some extent the problem of how the underwriter league tables are built, splitting all the proceeds equally among all the underwriters when there are more than one[6]. The calculation of the SMK is as follows:

$$Syndicate\ Market\ Share\ (SMK)\ = \frac{\sum_{i=1}^{n} Proceeeds\ underwritten\ BK_{ij}}{Total\ Proceeds\ issued\ in\ year\ j}\ x\ 100$$

n = number of underwriters in a deal *j= 2003, . . . , 2013*

Nevertheless, we have built other variables as robustness checks to ensure that the main results do not hinge upon comparing the top annual seven underwriters with the rest. These robustness checks are based on choosing underwriter subsidiaries instead of underwriter parents.

Finally, a distinctive feature of the banking corporate bonds that must be taken into account is the fact that banks can underwrite their own issues. The treatment of the so-called self-funded deals is relevant in order to compute the banks' market shares as underwriters. In this sense, the reasoning behind using the market share as proxy measure of reputation justifies the decision to exclude self-funded deals in the underwriters' market share computation. The market share of a specific underwriter will empirically capture its reputation only if this market share reflects the real volume of business performed for third parties. In this sense, underwriter league tables and regression analyses for banking corporate bonds are built and estimated excluding self-funded deals.

2.4.2. Database construction and variables

Data on original fixed non-perpetual corporate bonds issued in European countries are collected from the Dealogic Debt Capital Markets database. This database includes

[6] This construction of the underwriter league tables is also done in Abrahamson et al., (2011); Aggarwal et al., (2002); Migliorati and Vismara (2014) for IPOs rankings.

details of the bond issue, including yield, maturity, offer price, coupon, deal underwriter, rating, etc. The sample period goes from January 1, 2003 to January 1, 2014, thereby covering the pre-crisis and crisis years. Our database comprises two kinds of corporate bonds: industrial bonds – whose issuers are companies different from utilities and regulated firms (SIC: 4000s) and financial firms (SIC: 6000s) – and banking bonds. We exclude deals with missing values for at least one tranche in the underwriter parent and issue rating at launch.

In order to control for issuer characteristics we matched the Dealogic dataset with the information provided about the issuer by Compustat Global[7] (for industrial firms) and Bankscope-Bureau Van Dijk (for banks)[8]. Therefore, our sample is a matched database that includes deal characteristics (provided by Dealogic) and issuer characteristics (provided by Compustat Global and Bankscope). The sample includes 3,687 corporate bonds (1,490 industrial and 2,197 banking bonds) issued by 716 companies in 22 European countries[9] representing a total of $2,924,462 million. The yearly distribution of the deals is shown in Figure 4.1.

Dealogic provides information at a tranche level and a deal level for multiple tranche bonds. We follow a deal-level approach. The main reason is that the mandate contract agreed by issuer and underwriter is mainly done at deal level. Underwriters agree on providing their services even if there is more than one tranche. When underwriter/s and issuer discuss together the issuance characteristics they also discuss tranching as a credit enhancement technique. Provided that the negotiation is done at the same moment

[7] Compustat Global provides financial information for publicly traded companies covering around 90% of world market capitalization. As most corporate bonds are issued by public companies, using this dataset does not reduce the potential of our research.

[8] Furthermore, if we had used Compustat we would not have considered all those deals carried out by savings banks and cooperative banks – which constitute a significant part of the financial systems of Spain ("cajas de ahorros"), Italy ("casse di risparmio") and Germany ("sparkassen").

[9] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, United Kingdom.

and is included in a mandate contract, underwriters do not differ between tranches. While the proceeds, maturity and yield can vary within a deal, there is a single contract and underwriters are chosen collectively, not independently. Additionally, a deal-level approach means dealing with multiple tranches that have to be computed on a deal basis[10].

We have classified the variables into three different categories: issue characteristics, issuer characteristics and underwriter characteristics. Summary statistics are offered for the whole sample distinguishing between non-financial and bank corporate bonds. With regard to the main deal characteristics, the average issue volume in our full sample is $764.36 million with a mean maturity of 6.35 years. Non-financial corporate bond deals are brought to market by an average number of 3.20 underwriters per bond, which is in line with the 3.14 figure shown in Andres et al. (2014) for high-yield industrial bonds. However, in banking deals this average number is lower (2.19 underwriters/deal) suggesting that non-financial companies are more inclined to underwrite contracts with a syndicate of underwriters. Lastly, the large number of different underwriters merits special attention[11].

This unique sample, which contains detailed information about the bond terms and issuers – industrial firms and banks – and accounts for measuring reputation in syndicated-placed deals, represents largely the European debt markets. Therefore, it constitutes an appropriate empirical laboratory to draw conclusions about the access of industrial firms and banks to the debt markets via a reputable underwriter.

[10] In those cases in which there are more than one tranche we compute weighted averages for our variables at the deal level, weighting each tranche by its tranche value proceeds. In our sample 88% of the deals are one-tranche deals. For robustness purposes we have re-run our model excluding tranched issuances, obtaining similar results, which are available upon request.

[11] More than 80 underwriters provide their services in all different kinds of issue. This fact reflects the high number of participants in the underwriting market although it has been said that not all of them play the same role. While so many of them do not attain at least 1% of market share, the great investment and commercial banks are those that underwrite both the most deals and the most voluminous deals.

2.5. Methodology

2.5.1. Benchmark model on the matching probability for non-financial and bank bonds

Do banks and industrial companies have equal access to reputable underwriters in debt markets? The empirical strategy for addressing this question consists in estimating a binary choice model capable of explaining the probability of matching a reputable underwriter. Following previous studies, the estimation of the matching equation depends on variables that reflect issuer and bond characteristics. We use a logit model to test differences in issuer-reputable underwriter matching probability, accounting for deal and issuer features. The logit model employed is expressed as follows[12]:

$$\mathrm{E}(\mathrm{Y}\,|\mathrm{X}=\mathrm{x}) = (\Pr(Reputable\ UW = 1|\,\mathrm{X}) = \Lambda\,(\beta_0 + \beta_1 Z_{bond\ features} + \beta_2 Z_{issuer\ features} + \beta_3 ISSUER'S\ TYPE + \sum_{h=1}^{h} Year_h + \sum_{k=1}^{k} Deal\ nationality_k + e_i\,) \quad (1)$$

in which $Z_{bond\ features}$ is a vector of variables reflecting the deal's features and $Z_{issuer\ features}$ is a vector of variables containing the characteristics of the issuer firm. We include year dummies in all regressions to control for the chance of variations in debt financing over time. We also control for the nationality of the deal including country dummies in our regressions. Our main variable is a dummy controlling for the kind of issuer, being 1 if the issuer is a non-financial company. Bond features are especially important in terms of assessing the bond risk and thus how it affects its placement in the primary market. The natural logarithm of the deal proceeds is used as proxy of the *bond size*. The complexity of the marketing, pricing and selling activities increases with bond

[12] The link function of the logit model is an S-shaped or sigmoid function whose domain is between 0 and 1 (essential for a binary choice model). This model is estimated using the Maximum Likelihood Method.

size. As for the maturity, the relationship between maturity and risk results in long-term bonds entailing greater complexity when they are brought into market. Therefore it can be expected that these long-term bonds are likely to be underwritten by reputable underwriters. A dummy for *callable* bonds is also considered. Issuers will be highly likely to call a bond if the market interest rates have declined, allowing them to create a new issue at a lower rate. In this context, investors would have to reinvest in a less favorable environment. We also include a dummy for *investment grade* bonds in order to control for bond quality. We account for multiple-tranche deals, adding the *number of tranches* forming a bond. Lastly, we control for the *syndicate size*. Regarding issuer characteristics, consistent with previous studies, company size is proxied by the natural logarithm of the total assets of the company at the end of the year before the issue. In order to assess how the financial structure of the company influences the matching between issuers and underwriters we have included a firm leverage measure: the debt to equity ratio. Profitability is also accounted for by the Return on Assets (ROA)[13]. We control for bonds issued by a special purpose company or *finance vehicle*[14] dependent on their issuer parent. As abovementioned issuers' asymmetries matter, so we consider issuer experience in issuing corporate bonds with a dummy taking the value 1 if the issuer has not issued any corporate bond since 1988.

In order to test how banks were affected in terms of the reputable matching during the crisis, we have split the sample period initially into two sub-sample periods: pre-crisis and crisis. Given the particular features of the European case, we have further divided the crisis period into three sub-periods following the time division employed in Prokopczuk et al., (2013): subprime crisis, banking crisis and sovereign debt crisis.[15]

[13] As in other studies, all the balance sheet values were collected at the end of the year before the issuance.
[14] A finance vehicle is a company that operates as the cash pooling and treasury vehicle in financial markets issuing capital market instruments, such as commercial paper, medium-term notes, and long-term bonds.
[15] The subprime crisis started in July 2007 until the Lehman Brothers collapse became a fact on September 30, 2008. This period is referred to as the subprime crisis because it is when the subprime mortgages became unpaid in the United

2.5.2. Determinants of the matching and their impact on the probability

After testing differences in access to a reputable underwriter depending on the financial or non-financial nature of the issuer, we focus on which bond and issuer characteristics have a higher weight in the matching distinguishing by banks and non-financial issuers. The sample is split into bonds issued by non-financial companies and banks. We have also used a logit model because, in the case of a univariate discrete choice model, both probit and logit produce similar results[16]. Additionally, the magnitude of features that have an impact on the matching cannot be done estimating a joint model with all the variables and their interactions because the interpretation of these coefficients and computing the marginal effects entails a higher degree of complexity in non-linear models, as the literature has recognized (Ai and Norton, 2003; Berry et al., 2010; Brambor et al., 2006)[17]. This complexity cannot be solved choosing a logit model (Norton et al., 2004). We test whether the magnitude of the coefficients differs across groups (non-banks and banks) rather than across models. Therefore, we have separately estimated and computed two marginal effects for non-financial and banking corporate bonds: marginal effects at means (MEM) and average marginal effects (AME).

2.6. Results

2.6.1. Banks and industrial companies' access to a reputable underwriter

Table 2.6. offers some descriptive statistics comparing non-financial companies and bank bonds and then all of them together. T-statistics are included to test the

States. The next sub-sample period took place up until the end of June 2010. This is the so-called banking crisis. Finally, from July 2010 onwards the period is named the European sovereign crisis.

[16] Nonetheless, we have tested in unreported regressions that our results are robust after using the probit function as link function.

[17] Prior literature has highlighted that interaction terms in non-linear models are confusing to and misinterpreted by applied researchers. In this sense, a t-test cannot infer the statistical significance of the coefficient of the interaction effect.

difference in means. The Wilcoxon rank sum statistic is used to test the difference in medians. Overall, these tests reveal that bonds placed by reputable underwriters are significantly different from those placed by less reputable underwriters in several aspects. The results provided in this table are consistent with the prior literature on capital and debt issues.

According to mean- and median-difference tests, more reputable underwriters appear to place bonds with larger proceeds and longer maturity. A call option, which might increase the complexity of placing the bond, does not appear to be differently used in bonds placed by reputable or less reputable underwriters. Additionally, more reputable underwriters in our sample charge lower fees than the less reputable in industrial bonds, consistent with the differences found in Fang (2005)[18] for industrial bonds. Deals placed by reputable underwriters offer higher yields which is in line with issuing bonds with longer maturity. Issuer size – in terms both of market capitalization and of total assets – appears to be larger for deals placed by more reputable underwriters in the case of bank bonds.

The odds ratios of the logit regressions are reported in Table 2.7. Models 1 to 4 refer to non-financial and bank bonds whereas Models 5 and 6 are the baseline models for the whole sample. The findings suggest that large proceeds and longer maturity bonds are more likely to be issued by reputable underwriters. Furthermore, after controlling for other issuer characteristics such as profitability, leverage and experience in the markets, firm size is positive and statistically significant for both industrial and bank issues. The results suggest that compared to banks, non-financial companies have a higher likelihood

[18] Unlike Andres et al. (2014), who report that issues underwritten by reputable underwriters are not integrated by a large number of underwriters. These conflicting results are due to differences in the reputation measure used. As their criterion is based on finding at least one reputable underwriter within a deal, it is logical that syndicates formed by more underwriters are more likely to include at least one reputable underwriter. We have also obtained the same result as them in unreported statistics using their criterion. Building the average market share of all the underwriters in a deal and ranking it in the league tables allows us to mend this fact that overestimates reputation in a deal and explains why different results appear in practice.

of matching a reputable underwriter. The odds of issuing a bond placed by a reputable underwriter are about 1.50 times greater for non-financial companies than for banks after controlling for bond and issuer characteristics.

2.6.2. Access to a reputable underwriter: Pre-crisis vs. crisis period

Table 2.8. shows univariate statistics for pre-crisis and crisis periods, including mean and median tests for differences between reputable and non-reputable underwriters. Bonds were greater in size during the crisis. There was also an increase in the syndicate size, suggesting that underwriters were reluctant to bear alone all the risks of placing an issue in a climate of high uncertainty and information asymmetries. The effect of the economic deterioration is also observable in bond ratings, which on average were downgraded one point (18.75 "A+" vs. 17.49 "A"). Compared to the pre-crisis period, bonds placed by reputable underwriters during the crisis corresponded to larger, less leveraged and more profitable firms. This suggests that during the crisis, access to a reputable underwriter was more stringent for smaller firms.

Table 2.9. shows the estimation results for the logit models before and during the crisis. Each column, corresponding to a separate regression, reports the odds ratios for the sub-sample periods. There is no empirical evidence of differences in the probability of matching with a reputable underwriter between banks and non-financial companies in the pre-crisis period. However, during the financial crisis there is empirical evidence that banks faced more difficulties in the matching process compared to non-financial companies. During the subprime crisis and banking crisis periods their access to reputable underwriters was particularly affected. The odds of matching with a reputable underwriter were about 10.92 times lower for banks than for non-financial companies during the banking crisis. These results reflect that in this period banks were more vulnerable in

terms of accessing markets through reputable underwriters compared to non-financial companies.

2.6.3. The determinants of the matching probability

We investigate the determinant differences in the effects of deal and issuer features on the matching with reputable versus less reputable underwriters using logit multivariate regressions for non-financial issuers and banks.

Table 2.10. reports the logit estimation results for non-financial issuers. Different models are presented depending on the set of controls used: years, deal nationality and industry dummies[19]. As expected, the probability of matching with a reputable underwriter increases with bond size. This finding is quite robust across all specifications. Bonds with longer maturities are found more likely to be placed by reputable underwriters. The effect of callable bonds is not clear because it has a positive effect only at a 10% level of statistical significance before controlling for the nationality of the deal[20]. Furthermore, we find that first-time issuers are negatively related with the probability of matching a reputable underwriter, which suggests that newcomers face difficulties in allocating their deals. The evidence also suggests that more reputable underwriters place deals of bigger firms after controlling for issuers' industry and deal nationality (models IV – V). Leveraged firms, in terms of debt to equity ratio, are less likely to match with a reputable underwriter. Finally, bonds issued by finance vehicles, linked to their parent, are less likely to be placed by a reputable underwriter.

The same bond and issuer factors are analyzed for banking companies in Table 2.11. Large proceeds and longer maturity bonds are also more likely to be placed by reputable underwriters in the case of bank issuers. Therefore, these results are in line with

[19] Similar results are obtained in unreported regressions for subperiod dummies instead of year dummies.
[20] Anyway, as Fang, (2005) argues, the increasing complexity of placing bonds with a call option supports the fact that they are more likely to be underwritten by reputable underwriters.

the argument that reputable underwriters place complex bonds no matter the kind of issuer. The negative and significant coefficient for callable bonds suggests these bonds are less likely to be placed by a reputable underwriter in the case of bank issues. Some additional results are worth mentioning. In contrast with the findings on industrial firms, a bank being a first-time issuer does not affect the likelihood of engaging in a reputable relationship. These results would be in line with non-financial firms being more negatively affected by informational asymmetries. Finally, we find that banking corporate bonds issued by finance vehicles are more likely to be placed by a reputable underwriter; this result suggests that assigning the function of issuing capital market instruments to a specialized finance vehicle favors the reputable matching in the case of banks.

2.6.4. Economic significance

Overall, comparing Tables 2.10. and 2.11. we find that bond size, maturity and firm size are common determinants of the reputable matching for non-financial companies and banks but differences appear on callable and first-issuer bonds. The non-statistically significant coefficient for industrial callable bonds after controlling for time, deal nationality and industries suggest that the relationship between callabillity and the reputable matching might not necessarily be driven by complexity. However, the negative and significant coefficient for banking bonds shows that reputable underwriters are less likely to place callable bonds. Additionally, the negative and significant coefficient of first-time issuers for industrial firms compared with the non-statistically significant of this variable for banking bonds suggest that the lack of experience issuing debt securities puts more placement difficulties on non-financial firms. In this sense, the coverage and repeated participation of banks in capital markets may outweigh the uncertainty of a first issuance for them.

We quantify the economic significance of these matching determinants by computing marginal effects at means (MEM) and average marginal effects (AME). Table 2.12. reports the marginal effects, while Table 2.13. shows the statistical differences between industrial and bank issues. In these tables, marginal effects are computed for the more robust specifications after controlling for time, deal nationality and industries.

We find that a 1% increase in the bond size from its mean value increases matching probability by 13.6 percentage points for non-financial issues and 8% for bank issues. These results suggest that bond size has a relatively higher weight in the matching for non-financial firms compared to banks, as the marginal effect of the bond size on the probability of accessing a reputable underwriter is 1.70 larger for non-financial firms than for banks. As Figure 2.2. shows, this difference is non-monotonic. At the low 5^{th} size percentile the 1% increase marginal effect is the same for banks and non-financial issues (around 3.67 percentage points). However, as bond size increases, the marginal effects for non-financial companies augment rapidly while for banks the increment is marginal.

With regard to issuer size, a 1% increase in the total assets from its mean value increases the probability of matching by 5.95 percentage points for non-financial companies and 4.75 points for banks. Figure 2.2. summarizes these results. Comparing the marginal effects of bond and issuer size for non-financial firms and banks, we find that at their median values the bond size effect is 2.17 times larger than the issuer size effect for non-financial firms while this ratio is just 1.64 times larger for banks. Therefore, the weight of the issuer size effect in terms of the marginal effect of bond size is larger for banks than for non-financial firms. Finally, we find that on average a 1% increase in the maturity increases the probability by 7.22 percentage points for non-financial bonds and 8.85 points for banking bonds. Therefore, the marginal effect of the maturity on the probability is 1.15 times larger for banks than for non-financial firms at means. The effect

of maturity on the matching probability is greater for large banks than for large non-financial companies. These results suggest that firms' ability to adapt their bond design agreeing on longer maturities is significantly more important for banks than for non-financial companies.

2.6.5. Robustness

To check the robustness of our results we rerun the empirical tests to consider a range of factors that could potentially affect the findings. Our primary concern is to ensure that our results have not been driven by the possibility that some industrial companies and banks decided to issue corporate bonds because they had financial urgencies during crisis years when access to interbank and equity markets was largely restricted. We have re-estimated our baseline model on the subsample of bonds of firms that issued at least once in both periods: pre-crisis and crisis period. Table 2.14. reports the estimation results for these regressions. These results are similar to those of Tables 2.7. and 2.8. We find that, compared to non-financial companies, European banks encountered more difficulties in accessing a reputable underwriter, in particular during the banking crisis years. In this sub-sample, the odds of issuing a reputably placed bond continue to be greater (1.53 points) for non-financial companies than for banks between 2003 and 2013, with the lowest likelihood arising in the matching for banks during the subprime and banking crisis.

Another set of robustness checks refers to the measurement of reputation. One aspect that could affect the validity of our result is computing reputation on underwriter parents instead of the underwriter subsidiaries. Consistent with parent-level results, we find unreported results qualitatively and quantitatively similar.

Additionally, one difficulty that entails comparing reputation across countries is related to the presence of domestic issuances for which national underwriters may be

more reputable than for large international issuances[21]. In this sense, domestic bonds, underwritten by domestic banks and in the home market, have sharply decreased. Kollo (2005) reports that, in Europe, domestic bonds were at 62% before the adoption of the euro, whereas during 1999 – 2005, according to Lau and Yu (2010), they were at 34%. In our sample, 370 bonds out of 3,687 are domestic bonds (10% of the sample)[22]. In order to alleviate this concern, in unreported regressions available upon request, we have re-estimated our model separating between non-domestic bonds, Eurobonds and bonds issued in core European economies. The results obtained confirm that during our research period the odds of matching with a reputable underwriter were greater for non-financial companies than for banks.

We also conduct supplemental robustness regressions including extra controls. In these additional regressions we aim to account for some additional deal and issuer features in order to ensure that the main results do not hinge upon omitting variables. As additional controls we consider other bond characteristics (floated coupon, bond purpose, currencies and placement conditions), other issuer features (past issuer, public bank, self & not-self), and underwriting industry conditions (simultaneity).

Floated coupon is a dummy variable that controls for those bonds that have a variable rate. The *currency* in which the bond is fully issued is also considered to control for the exchange rate risk. *SEC* and *Rule 144A* variables are dummies referring to placement conditions that the bond issuance could fulfill mainly linked to registration rights. The inclusion of Rule 144A does not mean that the bond is traded in the U.S.; but it would mean that the bond offering is available to the public in the European country of

[21] We thank an anonymous referee for pointing out this issue.

[22] Following Migliorati and Vismara, (2014) we have computed a national ranking of underwriters for the core European economies (Germany, United Kingdom, France, Italy and Spain) for non-financial and bank deals during our research period. These league tables show that although some underwriters change their positions depending on the specific market, there is a clear presence of "bulge bracket banks" in the European underwriting industry. Furthermore, while during our research period commercial banks entered the underwriting industry, these banks, mainly domestic banks, only had a presence in their home market but without reaching the top positions, as the league tables reveal.

registration and that it would also be a private placement to qualified American institutional buyers.

With regard to the issuer characteristics, we have controlled for their nature. Issuer experience in capital markets can also be tested by including a dummy for *past issuers* in the previous 15 years before the sample period started. A positive sign is expected for non-financial companies' bonds in contrast to the negative sign presented in our baseline regressions for newcomers to capital markets. Finally, the *public bank* issuer dummy is reported for banking bonds if the issuer is not a private bank. This variable is included to reflect the bank's ownership[23]. Additionally, we control for self-funded deals including the variable *Self&NotSelf*, a dummy that takes the value 1 if the bank has in the same year issued bonds that it has placed by itself and other bonds that have been placed by third parties. This way we control for those issuers that chose to follow both alternatives in the same natural year. Lastly, some variables that are likely to reflect the market conditions of the issue date are included. In particular, *Simultaneity* reflects whether the European capital markets were hot at the issue date, in order to show that issuing in a "hot market" does not alter or affect the match. Additionally, we consider two time windows centered on the issue date: 30 and 90 days.

Table 2.15. reports the odds ratios of these regressions with extra controls. The results show that our results are robust to the inclusion of these additional control variables. Banks had more stringent access to reputable underwriters during the financial crisis, especially in the banking crisis period, after considering additional control variables. The statistical significance does not change when new variables are added into the regression. Bond size, maturity, total issue, first-issuer bonds and firm size are statistically significant in the different regressions. Table 2.16. presents the results for

[23] The traditional distinction between commercial and investment banks is less relevant since in Europe most of the banks perform activities that belong to both kinds of banking.

industrial and banking corporate bonds. It is worthwhile mentioning that *past issuer* is positive and statistically significant for non-financial companies, as more experience in capital markets seems to affect the matching positively. Furthermore, floated coupon bonds are less likely to be placed by reputable underwriters. And finally, bonds under Rule 144A are more likely to be placed by a reputable underwriter, which is expected because these bonds face fewer information asymmetries due to the registration requirements that they have to fulfill. In regard to banking, corporate bond results do not vary. It is noticeable that the indicator variable for public banks is not significant while the dummy controlling for banks that have placed by themselves and in a syndicate during the same year is positive but not significant.

2.7. Conclusions

This paper investigates, for the first time, the issuer-reputable underwriter matching process in corporate debt issuance by both banks and industrial companies.

We employ a combined dataset of corporate bonds issued in Europe during 2003–2013 by banks and non-financial companies. We find that banks had a lower probability of matching with a reputable underwriter compared to non-financial companies over the sample period. The lower likelihood for banks arose during the subprime and banking crisis in which the odds of matching with a reputable underwriter were about 4.32 and 10.92 times lower for banks respectively. However, no differences are found before the crisis in the access of banks and non-financial companies to reputable underwriters.

Our results also suggest that bond size and issuer size matter in the reputable matching. Bonds with large proceeds issued by large issuers are more likely to be placed by reputable underwriters. While bond size has a greater effect on the matching probability for non-financial companies, bank size is relatively more decisive for banks. The marginal effect of the bond size on the probability of accessing a reputable

underwriter is 1.70 larger for non-financial firms than for banks while this difference is not observed on issuer size. The relative weight of issuer size effect in terms of the bond size effect is larger for banks than for non-financial firms. The effect of bond size on the matching probability increases, as size does more for industrial firms than for banks. Furthermore, the effect of maturity on the matching probability was greater for large banks than for large non-financial companies, this difference increasing as maturity does.

These results have policy implications and suggest further research avenues. Further research in this area would allow better understanding of the information asymmetries that could affect banks as clients in the underwriting business. As the final conditions obtained on debt issuance depend on underwriter reputation, larger difficulties for banks in matching with a reputable underwriter hinder the consolidation of debt markets in Europe. Policies focused on improving market transparency and progress in the articulation of a common market framework in Europe would reduce the presence of information asymmetries, thereby favoring the consolidation of these markets and resulting in benefits for all kinds of issuers in Europe.

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Table 2.1.
Annual top 10 underwriters' parents market share rankings in the European fixed corporate bond market.
Non-financial companies bonds (2003-2013)

Rank	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	Deutsche Bank	Deutsche Bank	BNP Paribas	Deutsche Bank	Deutsche Bank	RBS	Deutsche Bank	Deutsche Bank	Deutsche Bank	HSBC	Deutsche Bank
2	Citi	BNP Paribas	Citi	Barclays	Citi	Deutsche Bank	RBS	Barclays	Citi	Barclays	HSBC
3	JPMorgan	JP Morgan	Credit Suisse	JPMorgan	HSBC	BNP Paribas	BNP Paribas	BNP Paribas	RBS	RBS	BNP Paribas
4	BNP Paribas	Citi	HSBC	Morgan Stanley	JPMorgan	HSBC	SG Corporate	RBS	BNP Paribas	Deutsche Bank	Barclays
5	HSBC	Barclays	Deutsche Bank	BNP Paribas	BNP Paribas	JPMorgan	HSBC	HSBC	Barclays	BNP Paribas	JPMorgan
6	RBS	Credit Suisse	SG Corporate	Citi	RBS	Barclays	Barclays	BofA Merrill Lynch	JPMorgan	JPMorgan	RBS
7	Barclays	ABN AMRO	ABN AMRO	RBS	Barclays	SG Corporate	JPMorgan	Citi	SG Corporate	Citi	Citi
8	Goldman Sachs	Goldman Sachs	JPMorgan	HSBC	SG Corporate	Goldman Sachs	Citi	SG Corporate	BofA Merrill Lynch	SG Corporate	BofA Merrill Lynch
9	Credit Suisse	HSBC	Barclays	ABN AMRO	Morgan Stanley	Calyon	Calyon	JPMorgan	HSBC	Goldman Sachs	Goldman Sachs
10	ABN AMRO	Merrill Lynch	RBC	Merrill Lynch	Credit Suisse	Merrill Lynch	BofA Merrill Lynch	Credit Agricole CIB	Goldman Sachs	BofA Merrill Lynch	SG Corporate

Table 2.2.
Annual top 10 underwriters' parents market share rankings in the European fixed corporate bond market
Banking bonds (excluded self-funded deals) (2003-2013)

Rank	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	UBS	UBS	UBS	Deustche Bank	Deutsche Bank	RBS	Barclays	Barclays	HSBC	BNP Paribas	Deutsche Bank
2	Credit Suisse	ING	Calyon	UBS	Barclays	BNP Paribas	HSBC	HSBC	BNP Paribas	Natixis	HSBC
3	Barclays	RBS	Deutsche Bank	ABN AMRO	Credit Suisse	HSBC	RBS	RBS	Barclays	JPMorgan	Goldman Sachs
4	RBS	Deutsche Bank	ABN AMRO	Barclays	Calyon	Barclays	BofA Merrill Lynch	BNP Paribas	Goldman Sachs	Barclays	JPMorgan
5	Deutsche Bank	Credit Suisse	BNP Paribas	BNP Paribas	BNP Paribas	Deutsche Bank	UBS	Deutsche Bank	BofA Merrill Lynch	Deutsche Bank	Barclays
6	ABN AMRO	JP Morgan	Credit Suisse	Calyon	JPMorgan	Calyon	BNP Paribas	BofA Merrill Lynch	Deutsche Bank	BofA Merrill Lynch	BNP Paribas
7	BNP Paribas	Fortis	UniCredit	Credit Suisse	UBS	UBS	JPMorgan	JPMorgan	RBS	Goldman Sachs	BofA Merrill Lynch
8	West LB	Citi	JPMorgan	UniCredit	UniCredit	SG Corporate	Deutsche Bank	Credit Suisse	JPMorgan	HSBC	Credit Agricole
9	HSBC	ABN AMRO	Rabobank	Rabobank	Rabobank	Banca IMI	Credit Suisse	SG Corporate	Credit Suisse	Citi	Citi
10	Morgan Stanley	Calyon	WestLB	RBS	HSBC	Morgan Stanley	SG Corporate	Citi	Citi	Credit Suisse	SG Corporate

Table 2.3.
Sample summary statistics

This table presents the summary statistics (mean and median) for the main variables in the sample dataset. The t-test values are based on 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.

		Corporate bonds			***Tests***	
		All	Non-financial	Banking	T- test	Wilcoxom Mann - Whitney
Proceeds ($ mill)	Mean	764.36	782.21	752.79	0.98	8.37***
	Median	446.72	551.81	343.95		
Maturity (years)	Mean	6.35	7.04	5.90	7.96***	14.34***
	Median	5	6.06	5		
Yield (%)	Mean	4.56	4.78	4.41	4.64***	8.45***
	Median	4.19	4.55	3.96		
Coupon (%)	Mean	4.54	4.75	4.41	4.83***	7.89***
	Median	4.20	4.50	4		
Gross Fees Spread (%)	Mean	0.76	0.59	0.85	-7.88***	-5.79***
	Median	0.45	0.35	0.66		
Effective Rating at Launch	Mean	17.91	15.41	19.37	-36.28***	-33.12***
	Median	19	15	20		
Number of Underwriters	Mean	2.59	3.20	2.19	18.61***	19.46***
	Median	2	3	2		
Callable	%	12.26%	22.26%	5.77%	14.01***	15.19***
Collateralized	%	1.15%	2.26%	0.43%	4.50***	5.19***
Private Placement	%	7.61%	6.84%	8.01%	-1.45	-1.43
Euro Placement	%	74.02%	77.64%	71.48%	4.55***	4.45***
SEC	%	3.26%	5.44%	1.83%	5.43***	5.97***
Rule 144A	%	7.68%	11.96%	4.91%	7.42***	7.99***
Issuer / Originator	number	716	437	279		
Issuer / Originator Parents	number	476	345	131		
Underwriters	number	146	90	146		
Nationality	number	22	20	20		
Deals	n	3687	1490	2197		
Tranches	n	4343	1874	2469		

Table 2.4.
Distribution of underwriters in the sample

This table presents the number and percentage of sole and multiple deals in the sample by kind of corporate bond.

	Non-financial issues		**Banking issues**	
Sole underwriter	210	14.09%	907	41.29%
2 Underwriters	422	28.32%	575	26.17%
3 Underwriters	294	19.73%	252	11.47%
4 Underwriters	292	19.60%	286	13.02%
5 Underwriters	133	8.93%	142	6.46%
> 5 Underwriters	139	9.33%	35	1.59%
Total	1490 deals		2197 deals	

Figure 2.1.
Deals and proceeds volume issued in the sample (2003 -20013)

These graphs plot the number of bonds and the volume of proceeds issued into the primary capital markets in the sample. The left-hand side graph is referred to the number of bonds while the right-hand side graph plots the volume of proceeds in millions of American dollars placed annually.

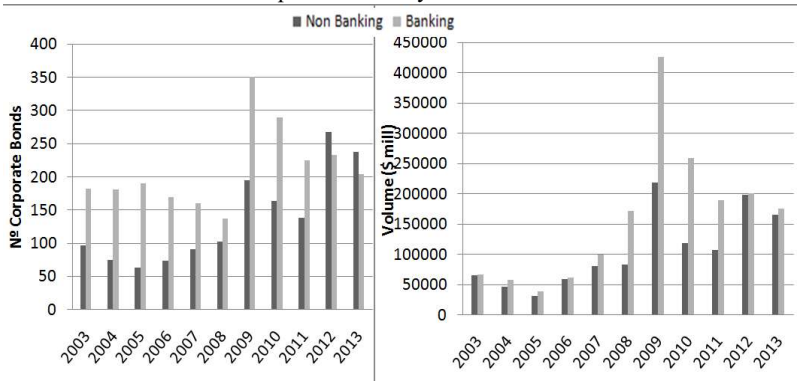


Table 2.5.
Empirical papers' results in the issuer-underwriter matching

This table presents the main empirical findings in the issuer-underwriter matching in the prior literature for equity and debt issues.

Variables	Sign	Empirical Papers	Proxy used	Dummy
Firm Size	+	Fang (2005)	Market value	
		Fernando, Gatchev and Spindt (2005)	Log (Market capitalization value)	
		Fernando et al., (2015)	Log (Market capitalization value)	
		Loureiro (2010)	Log (Total Assets)	
		Cao et al., (2014)	Log (Market capitalization value)	
		Lou and Vasvari (2013)	Log (Total Assets) & Log (Total Assets)^2	
Issue Size	+	Fernando et al., (2005)	Log (proceeds)	
		Fernando et al., (2015)	Log (proceeds)	
		Andres et al., (2014)	Log (proceeds)	
		Loureiro (2010)	Log (proceeds)	
		Benveniste et al., (2003)	Log (proceeds)	
		C. Chen, Shi and Xu, (2013)	Log (proceeds)	
Maturity	+	Fang (2005)	Log (Years)	
Callable	+ / Non-significant	Fang (2005)	Callable	Dummy
		Andres et al., (2014)	Redeemable	Dummy
Firm Profitability	- / Non-significant	Fang (2005)	ROA	
		Fernando, Gatchev and Spindt (2005)	Earnings / Dividend	Dummy
		Fernando et al., (2015)	ROA	
Firm Leverage	-	Lou and Vasvari (2013)	Long-term debt to total assets & Leverage^2	
Deal Rating	+	Fang (2005)	Investment Grade	Dummy
		Fernando, Gatchev and Spindt (2005)	Investment Grade	Dummy
		Andres et al., (2014)	BB / B	Dummy
Collateralized	- / Non-significant	Andres et al., (2014)	Unsecured	Dummy
Experience	+	Fang (2005)	Frequency	
		Fernando, Gatchev and Spindt (2005)	Log (years since foundation)	
		Andres et al., (2014)	First time issuer	Dummy
		Cao et al., (2014)	Past High reputable underwrite	Dummy
Volatility / Risk.	- / Non-significant	Fang (2005)	Sigma (Issuer's stock volatility)	
		Fernando, Gatchev and Spindt (2005)	Standard error of daily returns after the offer	
		Andres et al., (2014)	Beta	
		Cao et al., (2014)	Std. of market excess return over past year	
		Cao et al., (2014)	Market volatility	
		Benveniste et al., (2003)	Uncertainty (Expected price variation)	
Number of forecast	+	Fernando, Gatchev and Spindt (2005)	Log (nº of forecast)	
Venture backed firm	+	Fernando, Gatchev and Spindt (2005)	Venture backed company	Dummy
		Loureiro (2010)	Venture backed company	Dummy
		Benveniste et al., (2003)	Venture backed company	Dummy
Public Firm	+	Andres et al., (2014)	Public firm	Dummy
Rule 144A	Non-significant	Andres et al., (2014)	Rule 144A	Dummy
High Yield Index	+	Andres et al., (2014)	High Yield Index	
Protection of Shareholders Rights	-	Loureiro (2010)	Protection of shareholders rights	Dummy
Book Equity to Market Relation	+	Cao et al., (2014)	Book equity value / Mkt. capitalization	
Auditor	+ / Non-significant	Lou and Vasvari (2013)	Reputable auditor	Dummy
		C. Chen, Shi and Xu, (2013)	Auditor BIG four	Dummy

Table 2.6.
Univariate statistics by underwriter reputation

This table reports the descriptive statistics non-financial and banking corporate bonds in Europe by underwriter reputation during 2003 - 2013. Mean and median values are reported for deals underwritten by more reputable underwriters and less reputable underwriters. We consider a deal underwritten by a reputable underwriter if the underwriter or the syndicate is included in the top 7 of underwriter table leagues provided annually by Dealogic Capital Market according to the market share. Otherwise, the bond is reported as less reputable underwritten. We have reported variables that refer specifically to the bond, the issuer and the underwriter. 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.

	NON-FINANCIAL CORPORATE BONDS						**BANK CORPORATE BONDS**					
	Reputable Underwriter		*Less Reputable Underwriter*		t-test	z-test	*Reputable Underwriter*		*Less Reputable Underwriter*		t-test	z-test
Bond characteristics	**Mean**	**Median**	**Mean**	**Median**	**t -value**	**z-value**	**Mean**	**Median**	**Mean**	**Median**	**t - value**	**z - value**
Issue Size ($ mill)	947.11	673.06	693.10	476.77	-5.22***	-7.18***	814.41	373.64	721.96	329.31	-2.02**	-3.69***
Maturity (years)	8.05	7.00	6.49	5.71	-5.75***	-6.66***	6.97	5.00	5.36	4.58	-8.74***	-10.94***
Yield (%)	5.24	5.00	4.53	4.28	-6.47***	-7.26***	4.42	4.18	4.41	3.85	-0.14	-2.04**
Coupon (%)	5.16	5.00	4.53	4.25	-6.04***	-6.90***	4.48	4.25	4.37	3.87	-1.11	-2.32**
Offer Price (%)	99.80	99.69	99.94	99.86	1.14	5.86***	100.06	99.99	100.05	99.98	-0.18	-0.62
Effective rating launch	15.55	15.00	15.32	15.00	-1.24	-1.11	19.46	20.00	19.33	20.00	-1.20	-0.76
Gross Fee Spread	0.45	0.33	0.67	0.37	4.80***	2.56**	0.92	0.75	0.80	0.48	-2.72***	-4.05***
Number of Underwriters	2.94	3.00	3.34	3.00	4.73***	2.16**	1.76	1.00	2.40	2.00	12.17***	10.25***
Number of Tranches	1.34	1.00	1.21	1.00	-3.42***	-3.56***	1.15	1.00	1.15	1.00	-0.14	0.24
Past Issuer	0.57	1.00	0.42	0.00	-5.58***	-5.53***	0.74	1.00	0.64	1.00	-5.05***	-4.88***
First Time Issuer	0.21	0.00	0.21	0.00	0.20	0.20	0.05	0.00	0.09	0.00	2.90***	2.71***
Investment Grade	0.87	1.00	0.82	1.00	-3.00***	-2.87***	0.97	1.00	0.97	1.00	0.63	0.65
Callable	0.24	0.00	0.21	0.00	-1.21	-1.23	0.05	0.00	0.06	0.00	0.91	0.88
Collateralized	0.02	0.00	0.02	0.00	0.73	0.70	0.00	1.00	0.00	1.00	0.23	0.23
Finance Vehicle Issuer	0.38	0.00	0.43	0.00	1.82*	1.81*	0.11	0.00	0.05	0.00	-4.79***	-5.33***
Private Placement	0.08	0.00	0.06	0.00	-1.01	-1.04	0.04	0.00	0.10	0.00	5.46***	4.79***
Euro Placement	0.84	1.00	0.75	1.00	-4.33***	-4.10***	0.71	1.00	0.72	1.00	0.51	0.51
SEC	0.07	0.00	0.05	0.00	-1.42	-1.49	0.04	0.00	0.01	0.00	-4.05***	-5.04***
Rule 144A	0.15	0.00	0.10	0.00	-2.52**	-2.64***	0.06	0.00	0.04	0.00	-1.74*	-1.83*
Issuer characteristics	**Mean**	**Median**	**Mean**	**Median**	**t -value**	**z-value**	**Mean**	**Median**	**Mean**	**Median**	**t - value**	**z - value**
Total Assets ($ bill)	55.46	31.63	71.90	36.04	4.10***	1.38	952.33	635.65	574.16	458.73	-10.16***	-7.41***
Total Liabilities ($ bill)	35.34	20.99	47.24	22.71	4.57***	1.55	921.91	621.51	547.73	444.33	-10.40***	-7.62***
Total Equity ($ bill)	13.72	5.69	15.64	5.69	1.49	0.04	37.14	27.00	26.77	15.97	-6.71***	-5.47***
Leverage (TL/TA)	0.66	0.65	0.66	0.65	-0.19	-0.02	0.95	0.96	0.95	0.95	0.38***	-7.19***
Debt Equity ratio (TL/TE)	0.01	1.97	2.54	1.85	1.14	0.11	590.68	24.36	0.44	20.02	-0.49	-8.01***
Net Income ($ bill)	3.29	1.03	3.93	1.02	1.95*	-0.28	3.16	1.60	1.43	0.83	-8.32***	-7.72***
ROA (%)	4.75	4.15	4.20	3.87	-2.03**	-2.05**	0.00	0.00	0.00	0.00	-3.53***	-1.19
ROE (%)	13.71	13.52	13.00	13.48	-0.29	-1.68*	0.09	0.09	0.14	0.07	0.90	-7.54***
Market Capitalization Value ($ bill)	41.17	16.59	42.29	17.30	0.37	-0.78	51.52	46.18	27.72	17.28	-8.66***	-9.77***
Issuer Rating	15.50	15.00	15.36	15.00	-0.76	-0.76	19.30	19.67	18.76	19.00	-4.59***	-5.65***
Issuer Frequency	12.23	6.00	17.82	8.00	5.11***	2.01**	98.58	34.00	130.55	33.00	4.45***	-1.05
Issuer Parent Frequency	15.90	10.00	24.32	10.00	6.03***	1.37	132.05	73.00	151.13	54.00	2.76***	-4.16***
Underwriter characteristics	**Mean**	**Median**	**Mean**	**Median**	**t -value**	**z-value**	**Mean**	**Median**	**Mean**	**Median**	**t - value**	**z - value**
Average UW Market Share	7.63	7.17	3.45	3.85	-42.13***	-31.26***	7.08	6.45	2.61	2.82	-55.11***	-38.25***
Market Share Worst Reputable UW	5.23	5.33	1.47	1.06	-29.96***	-26.30***	6.05	6.03	1.36	0.87	-43.88***	-34.08***
Market Share Most Reputable UW	10.00	9.83	5.58	6.23	-30.35***	-24.26***	8.12	7.74	3.94	4.01	-40.64***	-30.15***

Table 2.7.
Probability of reputable matching: 2003 – 2013 (Odds ratio)

This table presents the odds ratio and the z-statistics for the logit regressions for non-financial and banking corporate bonds issued in Europe during 2003 - 2013. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Number of tranches reflects the tranches forming a deal. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. First issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. The variable firm size is the natural logarithm of the issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. The dummy variable INDUSTRIAL is a dummy taking the value 1 if the issuer is a non-bank company. 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	**Non- financial corporate bonds**		**Corporate Bonds**		**ALL**	
Issue Size	1.918***	1.918***	1.502***	1.502***	1.581***	1.581***
	(0.204)	(0.200)	(0.104)	(0.0707)	(0.0882)	(0.0626)
Maturity	1.568***	1.568***	1.735***	1.735***	1.806***	1.806***
	(0.273)	(0.252)	(0.216)	(0.181)	(0.206)	(0.152)
Callability	1.308	1.308	0.554**	0.554**	1.014	1.014
	(0.273)	(0.259)	(0.158)	(0.148)	(0.158)	(0.143)
Investment Grade	0.960	0.960	0.371*	0.371**	0.797	0.797
	(0.244)	(0.237)	(0.196)	(0.151)	(0.174)	(0.151)
Nº Tranches	1.037	1.037	0.736**	0.736***	0.963	0.963
	(0.104)	(0.119)	(0.112)	(0.0874)	(0.0585)	(0.0555)
Total Issue	0.715**	0.715***	0.882	0.882**	0.841**	0.841***
	(0.0970)	(0.0843)	(0.0747)	(0.0505)	(0.0615)	(0.0415)
First Issuer	0.569***	0.569**	0.792	0.792	0.664**	0.664***
	(0.123)	(0.128)	(0.214)	(0.196)	(0.113)	(0.104)
Firm Size	1.329**	1.329**	1.273**	1.273***	1.120	1.120**
	(0.171)	(0.157)	(0.151)	(0.0849)	(0.0924)	(0.0558)
ROA	0.978	0.978	1.193e+11	1.193e+11	0.978	0.978*
	(0.0158)	(0.0148)	(2.941e+12)	(1.965e+12)	(0.0221)	(0.0131)
Debt to Equity	0.996***	0.996***	1.000	1.000	1.000***	1.000**
	(0.00112)	(0.00118)	(7.74e-06)	(7.79e-06)	(4.40e-06)	(7.40e-06)
Syndicate Size	0.730***	0.730***	0.648***	0.648***	0.715***	0.715***
	(0.0424)	(0.0388)	(0.0806)	(0.0370)	(0.0490)	(0.0248)
Finance Vehicle	0.670**	0.670**	3.223*	3.223***	0.744	0.744**
	(0.136)	(0.122)	(1.980)	(0.750)	(0.199)	(0.0914)
INDUSTRIAL					1.504*	1.504**
					(0.361)	(0.239)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	-	-	-	-
Countries	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered Issuer	Robust	Clustered Issuer	Robust	Clustered Issuer	Robust
Pseudo R^2	0.2469	0.2469	0.2220	0.2220	0.1828	0.1828
Log-Likelihood	-726.7436	-726.7436	-1074.348	-1074.348	-1918.3611	-1918.3611
p-value ($chi^{2)}$)	0.00	0.00	0.00	0.00	0.00	0.00
Observations	1,490	1,490	2,197	2,197	3,687	3,687

Table 2.8.
Univariate statistics by issue date: Precrisis vs. crisis

This table reports the descriptive statistics for the sample of corporate bonds issued in Europe distinguishing on the issue date. Mean and median values are reported for deals issued before (pre-crisis) and after (crisis) the 30th June 2007. The statistics for deals underwritten by reputable underwriter are also reported. We consider a deal as reputable placed if the underwriter or the syndicate is included in the top 7 of underwriter table leagues provided annually by Dealogic Capital Market according to the market share. We have reported variables that refer specifically to the bond, the issuer and the underwriter. We use two tails t-test for difference in means between the two groups of corporate bonds (pre-crisis vs. crisis) and Wilcoxon Mann- Whitney test is used for medians (pre-crisis vs. crisis). *, **, *** Different is significant at less than 10 %, 5%, 1% level.

	CORPORATE BONDS (ALL)						*Precrisis*		*Crisis*	
	Precrisis		*Crisis*		t-test	z-test	Reputable Underwriter		Reputable Underwriter	
Bond Characteristics	**Mean**	**Median**	**Mean**	**Median**	**t - value**	**z - value**	**Mean**	**Median**	**Mean**	**Median**
Issue Size ($ mill)	444.78	241.38	910.05	630.87	17.48***	16.91***	523.69	326.79	910.05	630.87
Maturity (years)	6.92	5.55	6.09	5.00	-5.28***	-5.62***	7.45	6.93	6.09	5.00
Yield (%)	4.70	4.43	4.49	4.07	-2.31**	-2.75***	4.45	4.43	4.49	4.07
Coupon (%)	4.73	4.38	4.46	4.00	-3.31***	-3.31***	4.53	4.50	4.46	4.00
Offer Price (%)	100.08	100.00	99.95	99.89	-2.69***	-5.37***	100.14	99.94	99.95	99.89
Effective rating launch	18.75	20.00	17.49	18.00	-10.09***	-12.44***	18.45	19.00	17.49	18.00
Gross Fee Spread	0.96	0.76	0.52	0.28	-14.18***	-14.76***	0.90	0.75	0.52	0.28
Number of Underwriters	1.84	2.00	2.93	3.00	24.34***	19.49***	1.95	2.00	2.93	3.00
Number of Tranches	1.16	1.00	1.21	1.00	1.43	5.08***	1.20	1.00	1.21	1.00
Past Issuer	0.73	1.00	0.54	1.00	-11.99***	-11.30***	0.77	1.00	0.54	1.00
First Time Issuer	0.11	0.00	0.14	0.00	2.41**	2.33**	0.11	0.00	0.14	0.00
Investment Grade	0.93	1.00	0.92	1.00	-1.57	-1.52	0.92	1.00	0.92	1.00
Callable	0.11	0.00	0.13	0.00	1.40	1.37	0.11	0.00	0.13	0.00
Collateralized	0.01	0.00	0.01	0.00	2.59***	2.22**	0.01	0.00	0.01	0.00
Finance Vehicle Issuer	0.21	0.00	0.20	0.00	-0.39	-0.39	0.21	0.00	0.20	0.00
Private Placement	0.09	0.00	0.07	0.00	-1.39	-1.43	0.04	0.00	0.07	0.00
Euro Placement	0.70	1.00	0.76	1.00	3.56***	3.64***	0.74	1.00	0.76	1.00
SEC	0.02	0.00	0.04	0.00	3.71***	3.28***	0.02	0.00	0.04	0.00
Rule 144A	0.06	0.00	0.09	0.00	3.38***	3.15***	0.07	0.00	0.09	0.00
Issuer Characteristics	**Mean**	**Median**	**Mean**	**Median**	**t - value**	**z - value**	**Mean**	**Median**	**Mean**	**Median**
Total Assets ($ bill)	282.79	150.23	510.54	164.96	13.13***	5.45***	292.85	120.66	510.54	164.96
Total Liabilities ($ bill)	267.20	113.11	479.06	115.08	12.58***	4.81***	278.93	102.47	479.06	115.08
Total Equity ($ bill)	15.37	8.17	27.71	11.37	15.06***	9.67***	15.08	6.04	27.71	11.37
Leverage (TL/TA)	0.86	0.95	0.82	0.93	-4.71***	-8.82***	0.84	0.95	0.82	0.93
Debt Equity ratio (TL/TE)	373.24	17.94	254.03	13.70	-0.59	-9.59***	507.02	17.87	254.03	13.70
Net income ($ bill)	2.25	0.75	2.87	1.25	3.79***	5.10***	2.20	0.82	2.87	1.25
ROA (%)	1.63	0.00	1.84	0.00	1.52	2.78***	1.70	0.00	1.84	0.00
ROE (%)	4.39	0.12	5.81	0.12	1.25	0.07	4.25	0.13	5.81	0.12
Market Capitalization Value ($ bill)	49.37	26.04	37.79	18.28	-3.93***	-3.19***	42.08	21.79	37.79	18.28
Issuer Rating	18.83	20.00	17.19	17.67	-12.95***	-16.89***	18.41	19.67	17.19	17.67
Issuer Frequency	106.42	22.00	66.46	14.50	-7.35***	-7.08***	93.11	16.00	66.46	14.50
Issuer Parent Frequency	131.79	63.00	80.01	29.00	-9.62***	-10.65***	118.28	63.00	80.01	29.00
Underwriter Characteristics	**Mean**	**Median**	**Mean**	**Median**	**t - value**	**z - value**	**Mean**	**Median**	**Mean**	**Median**
Average UW Market Share	5.08	5.09	4.12	4.06	-9.55***	-9.55***	7.52	7.22	4.12	4.06
Market Share Worst Reputable UW	3.86	3.23	2.42	1.37	-14.15***	-15.55***	6.00	5.92	2.42	1.37
Market Share Most Reputable UW	6.39	6.32	5.88	6.23	-4.12***	-4.75***	9.05	9.04	5.88	6.23

Table 2.9.
Probability of reputable matching by issue date: Precrisis vs. crisis (Odds ratio)

This table presents the odds ratio and the z-statistics for the logit regressions for corporate bond issued in Europe during 2003 - 2013. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Number of tranches reflects the tranches forming a deal. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. First issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. The variable firm size is the natural logarithm of the issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. The dummy variable INDUSTRIAL is a dummy taking the value 1 if the issuer is a non-bank company. Precrisis comprises the period of time from 01/01/03 - 30/06/07. Subprime crisis starts 01/07/07 until 30/09/08. The banking crisis window comprises 01/10/08 - 30/06/10. Since 01/07/10 we consider the period as the European sovereign debt crisis. 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	**Precrisis**		**Subprime Crisis**		**Banking Crisis**		**Sovereign Debt Crisis**	
Issue Size	1.490***	1.490***	1.833**	1.833***	1.632***	1.632***	1.676***	1.676***
	(0.124)	(0.0976)	(0.540)	(0.373)	(0.149)	(0.171)	(0.197)	(0.124)
Maturity	1.444**	1.444***	1.019	1.019	2.689***	2.689***	1.981***	1.981***
	(0.213)	(0.192)	(0.279)	(0.264)	(0.758)	(0.575)	(0.331)	(0.318)
Callability	0.847	0.847	3.318	3.318	1.148	1.148	1.401	1.401*
	(0.232)	(0.203)	(2.700)	(2.813)	(0.464)	(0.464)	(0.302)	(0.282)
Investment Grade	0.749	0.749	0.511	0.511	0.608	0.608	0.866	0.866
	(0.287)	(0.253)	(1.157)	(1.016)	(0.282)	(0.295)	(0.260)	(0.253)
Nº Tranches	0.894	0.894	0.748	0.748	0.839	0.839	1.037	1.037
	(0.0929)	(0.0878)	(0.270)	(0.258)	(0.168)	(0.151)	(0.105)	(0.0968)
Total Issue	0.950	0.950	1.091	1.091	0.477***	0.477***	0.855	0.855*
	(0.0827)	(0.0727)	(0.282)	(0.244)	(0.0977)	(0.0727)	(0.0964)	(0.0707)
First Issuer	0.684	0.684	0.587	0.587	0.786	0.786	0.478**	0.478**
	(0.192)	(0.181)	(0.420)	(0.388)	(0.284)	(0.277)	(0.162)	(0.148)
Firm Size	0.994	0.994	1.010	1.010	1.939***	1.939***	1.051	1.051
	(0.104)	(0.0742)	(0.270)	(0.223)	(0.394)	(0.307)	(0.127)	(0.0897)
ROA	0.993	0.993	0.888	0.888**	0.919**	0.919***	1.007	1.007
	(0.0271)	(0.0246)	(0.0737)	(0.0484)	(0.0375)	(0.0297)	(0.0230)	(0.0207)
Debt to Equity	1.000***	1.000	1.000***	1.000***	1.000	1.000	1.000	1.000
	(4.39e-06)	(9.59e-06)	(1.99e-05)	(1.82e-05)	(3.29e-05)	(2.81e-05)	(1.41e-05)	(2.97e-05)
Syndicate Size	0.896	0.896	0.799	0.799	0.660***	0.660***	0.654***	0.654***
	(0.119)	(0.0717)	(0.195)	(0.136)	(0.0684)	(0.0527)	(0.0521)	(0.0364)
Finance Vehicle	0.542*	0.542***	0.615	0.615	1.003	1.003	0.819	0.819
	(0.201)	(0.126)	(0.432)	(0.284)	(0.420)	(0.263)	(0.198)	(0.184)
INDUSTRIAL	1.388	1.388	4.325	4.325*	10.92***	10.92***	0.683	0.683
	(0.527)	(0.369)	(4.256)	(3.485)	(5.425)	(4.541)	(0.259)	(0.199)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered Issuer	Robust	Clustered Issuer	Robust	Clustered Issuer	Robust	Clustered Issuer	Robust
Pseudo R^2	0.0867	0.0867	0.2010	0.2010	0.3272	0.3272	0.1648	0.1648
Log-Likelihood	-701.6138	-701.6138	-137.8479	-137.8479	-342.8101	-342.8101	-644.0233	-644.0233
p-value ($chi^{2)}$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observations	1,111	1,111	251	251	830	830	1,495	1,495

Table 2.10.
Probability of reputable matching for non-Financial corporate bonds (Logit coefficients)

This table presents the logit coefficients and the z-statistics (in parenthesis) for the logit regressions for non-financial corporate bonds issued in Europe during 2003-2013. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Number of tranches reflects the tranches forming a deal. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. First issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. The variable firm size is the natural logarithm of issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Industries dummies are based on SIC classification. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. Z-statistics are based on issuer clustered standard errors (in Model I – IV). 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	**I**	**II**	**III**	**IV**	**V**
Issue Size	0.721***	0.645***	0.716***	0.652***	0.652***
	(0.117)	(0.105)	(0.108)	(0.106)	(0.104)
Maturity	0.426**	0.494**	0.410**	0.450***	0.450***
	(0.209)	(0.215)	(0.169)	(0.174)	(0.161)
Callability	0.367*	0.382*	0.248	0.268	0.268
	(0.203)	(0.214)	(0.200)	(0.209)	(0.198)
Investment Grade	0.257	0.111	0.0861	-0.0409	-0.0409
	(0.261)	(0.278)	(0.261)	(0.254)	(0.247)
Nº Tranches	0.103	0.0912	0.0416	0.0364	0.0364
	(0.105)	(0.0976)	(0.101)	(0.0999)	(0.114)
Total Issue	-0.185	-0.236*	-0.337**	-0.336**	-0.336***
	(0.147)	(0.138)	(0.137)	(0.136)	(0.118)
First Issuer	-0.728***	-0.634***	-0.693***	-0.564***	-0.564**
	(0.220)	(0.209)	(0.223)	(0.215)	(0.225)
Firm Size	-0.0101	0.219	0.115	0.284**	0.284**
	(0.141)	(0.134)	(0.128)	(0.129)	(0.118)
ROA	-0.0114	-0.00616	-0.0250	-0.0219	-0.0219
	(0.0171)	(0.0164)	(0.0169)	(0.0162)	(0.0151)
Debt to Equity	-0.00371***	-0.00431***	-0.00344***	-0.00366***	-0.00366***
	(0.00115)	(0.00122)	(0.00111)	(0.00112)	(0.00119)
Syndicate Size	-0.293***	-0.314***	-0.284***	-0.314***	-0.314***
	(0.0588)	(0.0557)	(0.0610)	(0.0580)	(0.0531)
Finance Vehicle	-0.412**	-0.303*	-0.587***	-0.400**	-0.400**
	(0.199)	(0.191)	(0.215)	(0.203)	(0.183)
Year	Yes	Yes	Yes	Yes	Yes
Industries	No	Yes	No	Yes	Yes
Countries	No	No	Yes	Yes	Yes
Standard Errors	Cluster Issuer	Cluster Issuer	Cluster Issuer	Cluster Issuer	Robust
Pseudo R^2	0.1951	0.2206	0.2282	0.2469	0.2469
Log-Likelihood	-776.71	-752.16	-744.75	-726.74	-726.74
p-value ($chi^{2)}$)	0.00	0.00	0.00	0.00	0.00
Predicted Prob. (vs. Actual 0.35)	0.35	0.35	0.35	0.35	0.35
Observations	1,490	1,490	1,490	1,490	1,490

Table 2.11.
Probability of reputable matching for banking corporate bonds (Logit coefficients)

This table presents the logit coefficients and the z-statistics (in parenthesis) for the logit regressions for banking corporate bonds issued in Europe during 2003- 2013. The dependent variable is a binary variable that takes the value 1 if the bond is underwritten by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Number of tranches reflects the tranches forming a deal. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. First issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. The variable firm size is the natural logarithm of the issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. Z-statistics are based on issuer clustered standard errors (in Model I – II). 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	**I**	**II**	**III**
Issue Size	0.434***	0.407***	0.407***
	(0.0769)	(0.0694)	(0.0471)
Maturity	0.626***	0.551***	0.551***
	(0.135)	(0.125)	(0.104)
Callability	-0.573*	-0.590**	-0.590**
	(0.297)	(0.284)	(0.266)
Investment Grade	-1.345**	-0.990*	-0.990**
	(0.551)	(0.528)	(0.407)
Nº Tranches	-0.249*	-0.307**	-0.307***
	(0.148)	(0.152)	(0.119)
Total Issue	-0.197***	-0.125	-0.125**
	(0.0751)	(0.0846)	(0.0573)
First Issuer	-0.311	-0.233	-0.233
	(0.276)	(0.270)	(0.248)
Firm Size	0.416***	0.242**	0.242***
	(0.126)	(0.119)	(0.0666)
ROA	22.09	25.51	25.51
	(21.39)	(24.64)	(16.46)
Debt to Equity	8.49e-06	6.80e-06	6.80e-06
	(8.30e-06)	(7.74e-06)	(7.79e-06)
Syndicate Size	-0.512***	-0.433***	-0.433***
	(0.133)	(0.124)	(0.0570)
Finance Vehicle	1.163	1.170*	1.170***
	(0.712)	(0.614)	(0.233)
Year	Yes	Yes	Yes
Countries	No	Yes	Yes
Standard Errors	Cluster Issuer	Cluster Issuer	Robust
Pseudo R^2	0.2092	0.2220	0.2220
Log-Likelihood	-1092.06	-1074.35	-1074.35
p-value ($chi^{2)}$)	0.00	0.00	0.00
Predicted Prob. (vs. Actual 0.33)	0.32	0.32	0.32
Observations	2,197	2,197	2,197

Table 2.12.
Marginal effects on the probability of reputable matching for non-financial and banks corporate bonds

This table presents the marginal effects for the logit regressions for non-financial and banks corporate bonds issued in Europe during 2003- 2013. The dependent variable is a binary variable that takes the value 1 if the bond is underwritten by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Number of tranches reflects the tranches forming a deal. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. First issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. The variable firm size is the natural logarithm of the issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. Industries dummies are based on SIC classification. A constant term (not reported) is included in all regressions. MEM presents the Marginal Effects at Means. AME presents the Average Marginal Effects. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

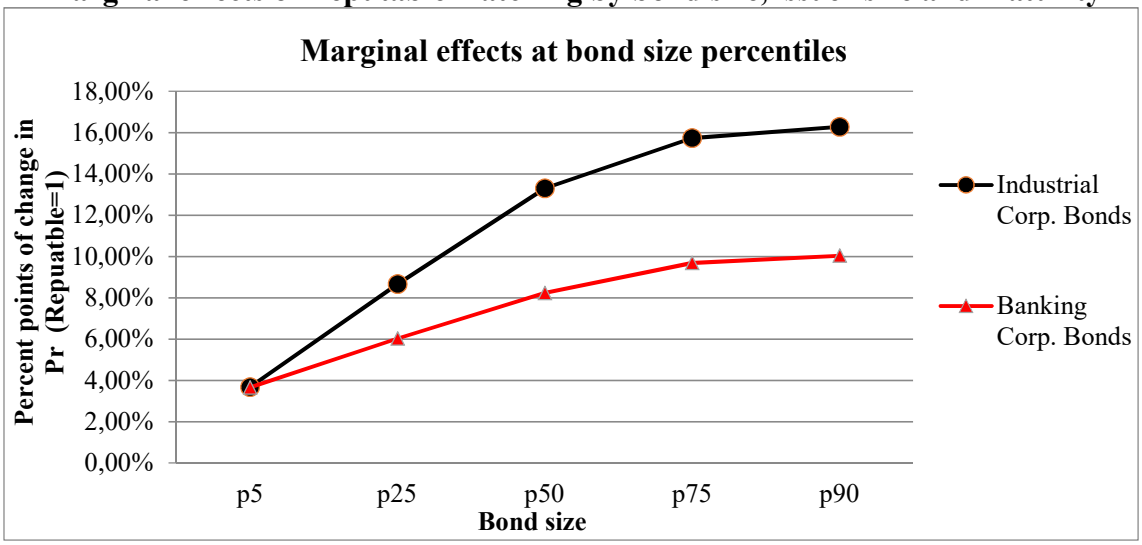
	NON FINANCIAL				BANKS			
VARIABLES	**MEM**	**AME**	**MEM**	**AME**	**MEM**	**AME**	**MEM**	**AME**
Issue Size	0.136***	0.104***	0.136***	0.104***	0.0800***	0.0653***	0.0800***	0.0653***
	(0.0222)	(0.0165)	(0.0215)	(0.0161)	(0.0145)	(0.0102)	(0.00920)	(0.00708)
Maturity	0.0942***	0.0722***	0.0942***	0.0722***	0.108***	0.0885***	0.108***	0.0885***
	(0.0371)	(0.0282)	(0.0336)	(0.0256)	(0.0249)	(0.0203)	(0.0206)	(0.0163)
Callability	0.0561	0.0430	0.0561	0.0430	-0.116**	-0.0948**	-0.116**	-0.0948**
	(0.0438)	(0.0333)	(0.0416)	(0.0317)	(0.0560)	(0.0455)	(0.0523)	(0.0425)
Investment Grade	-0.00857	-0.00656	-0.00857	-0.00656	-0.195*	-0.159*	-0.195**	-0.159**
	(0.0532)	(0.0408)	(0.0516)	(0.0395)	(0.103)	(0.0834)	(0.0799)	(0.0651)
Nº Tranches	0.00761	0.00583	0.00761	0.00583	-0.0604**	-0.0493**	-0.0604***	-0.0493***
	(0.0209)	(0.0160)	(0.0239)	(0.0183)	(0.0300)	(0.0238)	(0.0233)	(0.0190)
Total Issue	-0.0703**	-0.0539**	-0.0703***	-0.0539***	-0.0247	-0.0202	-0.0247**	-0.0202**
	(0.0282)	(0.0215)	(0.0246)	(0.0186)	(0.0166)	(0.0135)	(0.0113)	(0.00917)
First Issuer	-0.118***	-0.0905***	-0.118**	-0.0905**	-0.0459	-0.0375	-0.0459	-0.0375
	(0.0451)	(0.0342)	(0.0473)	(0.0359)	(0.0534)	(0.0434)	(0.0488)	(0.0398)
Firm Size	0.0595**	0.0456**	0.0595**	0.0456**	0.0475**	0.0388**	0.0475***	0.0388***
	(0.0268)	(0.0205)	(0.0246)	(0.0187)	(0.0235)	(0.0186)	(0.0131)	(0.0106)
ROA	-0.00458	-0.00351	-0.00458	-0.00351	5.017	4.098	5.017	4.098
	(0.00336)	(0.00257)	(0.00317)	(0.00241)	(4.828)	(3.980)	(3.217)	(2.636)
Debt to Equity	-0.000765***	-0.000586***	-0.000765***	-0.000586***	1.34e-06	1.09e-06	1.34e-06	1.09e-06
	(0.000234)	(0.000179)	(0.000249)	(0.000190)	(1.51e-06)	(1.24e-06)	(1.53e-06)	(1.25e-06)
Syndicate Size	-0.0658***	-0.0504***	-0.0658***	-0.0504***	-0.0852***	-0.0696***	-0.0852***	-0.0696***
	(0.0125)	(0.00941)	(0.0112)	(0.00840)	(0.0262)	(0.0204)	(0.0110)	(0.00859)
Finance Vehicle	-0.0837**	-0.0641**	-0.0837**	-0.0641**	0.230*	0.188*	0.230***	0.188***
	(0.0419)	(0.0323)	(0.0380)	(0.0290)	(0.122)	(0.0978)	(0.0452)	(0.0367)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	-	-	-	-
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Cluster Issuer	Cluster Issuer	Robust	Robust	Cluster Issuer	Cluster Issuer	Robust	Robust
Pseudo R^2	0.2469		0.2469		0.2220		0.2220	
Log-Likelihood	-726.74		-726.74		-1074.35		-1074.35	
p-value ($chi^{2)}$)	0.00		0.00		0.00		0.00	
Observations	1,490		1,490		2,197		2,197	

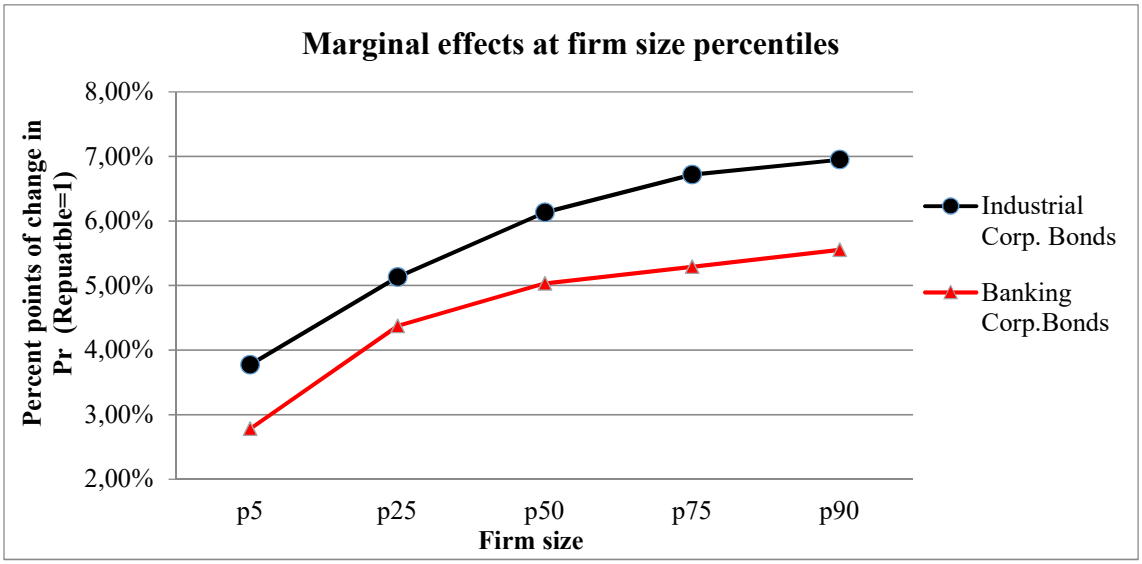
Table 2.13.
Marginal effects comparison on the probability of reputable matching

This table presents the marginal effects for the logit regressions for non-financial and banking corporate bonds issued in Europe during 2003 - 2013. This table the marginal effects at means (MEM) and the average marginal effects (AME). The marginal effects are reported for all the variables included in the regressions even though some of them were not statistically significant at 10%. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. The variable firm size is the natural logarithm of the issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. Industries dummies are based on SIC classification.

	MEM: Marginal Effects at Means			**AME: Average Marginal Effects**		
	Non-financial – Banks			**Non-financial – Banks**		
VARIABLES	**Difference**	**Diff in percentage**	**Ratio**	**Difference**	**Diff in percentage**	**Ratio**
Issue Size	0.056	5.60	1.70	0.0387	3.87	1.59
Maturity	-0.0138	-1.38	0.87	-0.0163	-1.63	0.82
Callability	0.1721	17.21	-0.48	0.1378	13.78	-0.45
Investment Grade	0.18643	18.64	0.04	0.15244	15.24	0.04
Nº Tranches	0.06801	6.80	-0.13	0.05513	5.51	-0.12
Total Issue	-0.0456	-4.56	2.85	-0.0337	-3.37	2.67
First Issuer	-0.0721	-7.21	2.57	-0.053	-5.30	2.41
Firm Size	0.012	1.20	1.25	0.0068	0.68	1.18
ROA	-5.02158	-502.16	0.00	-4.10151	-410.15	0.00
Debt to Equity	-0.00076634	-0.08	-570.90	-0.00058709	-0.06	-537.61
Syndicate Size	0.0194	1.51	0.77	0.0192	1.92	0.72
Finance Vehicle	-0.3137	-30.52	-0.36	-0.2521	-25.21	-0.34
	Non-financial	Banks		Non-financial	Banks	
Year	Yes	Yes		Yes	Yes	
Industries	Yes	Yes		Yes	Yes	
Countries	Yes	Yes		Yes	Yes	
Standard Errors	Cluster Issuer	Cluster Issuer		Cluster Issuer	Cluster Issuer	
Pseudo R^2	0.2454	0.2213		0.2454	0.2213	
Log-Likelihood	-728.2	-1075.28		-728.2	-1075.28	
p-value ($chi^{2)}$)	0.00	0.00		0.00	0.00	
Observations	1,490	2,197		1,490	2,197	

Figure 2.2.
Marginal effects on reputable matching by bond size, issuer size and maturity





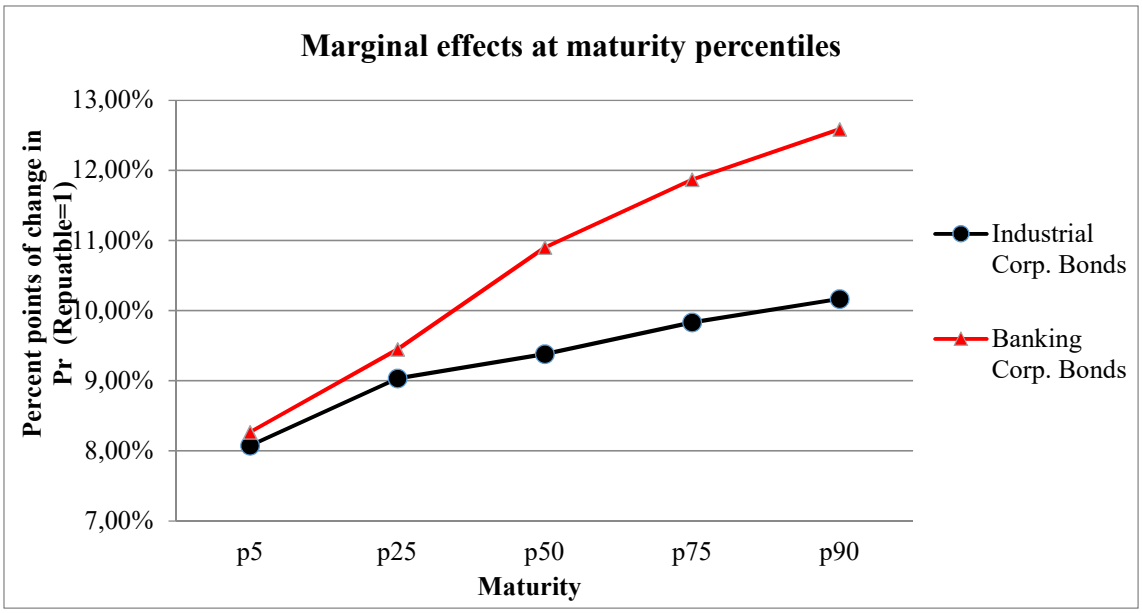


Table 2.14.
Robustness on the probability of reputable matching: Sub-sample of bonds of industrial firms and banks that issued at least once in the precrisis and crisis periods (Odds ratio)

This table presents the odds ratio and the z-statistics for the logit regressions for corporate bond issued in Europe during 2003 – 2013 for the sub-sample of bonds of industrial firms and banks that issued at least once in both periods: precrisis and the crisis. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's years to mature. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Number of tranches reflects the tranches forming a deal. Total issue is the natural logarithm of the sum of relative issue sizes during the sample period. First issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. The variable firm size is the natural logarithm of the issuer's total assets. ROA is computed as the return on assets based on the net incomes and total assets. Debt equity is a ratio of total liabilities to total equity. Syndicate size reflects the number of deal underwriters. Finance vehicle is a variable taking the value 1 if the issuer is a finance vehicle company. The dummy variable INDUSTRIAL is a dummy taking the value 1 if the issuer is a non-bank company. Precrisis comprises the period of time from 01/01/03 - 30/06/07. Subprime crisis starts 01/07/07 until 30/09/08. The banking crisis window comprises 01/10/08 - 30/06/10. Since 01/07/10 we consider the period as the European sovereign debt crisis. A constant term (not reported) is included in all regressions. Z-statistics are based on robust standard errors. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

VARIABLES	2003 - 2013	Precrisis	Subprime crisis	Banking crisis	Sovereign Debt crisis
Issue Size	1.630***	1.526***	1.919***	1.693***	1.731***
	(0.0711)	(0.106)	(0.407)	(0.193)	(0.161)
Maturity	1.653***	1.369**	0.828	2.635***	1.978***
	(0.149)	(0.192)	(0.219)	(0.641)	(0.348)
Callability	0.930	0.883	2.165	1.247	1.072
	(0.151)	(0.234)	(1.738)	(0.617)	(0.278)
Investment Grade	0.791	0.367**	0.862	1.031	1.309
	(0.187)	(0.172)	(1.593)	(0.626)	(0.552)
Nº Tranches	0.892	0.911	0.803	0.714	0.957
	(0.0652)	(0.0701)	(0.292)	(0.149)	(0.104)
Total Issue	0.795***	0.999	0.984	0.390***	0.796**
	(0.0490)	(0.0974)	(0.294)	(0.0693)	(0.0881)
First Issuer	0.759	0.684	0.343	1.357	0.390
	(0.194)	(0.220)	(0.411)	(0.911)	(0.354)
Firm Size	1.084	0.955	0.995	2.002***	0.984
	(0.0624)	(0.0832)	(0.243)	(0.376)	(0.110)
ROA	0.965**	0.987	0.892**	0.940	0.985
	(0.0157)	(0.0270)	(0.0498)	(0.0425)	(0.0316)
Debt to Equity	1.000**	1.000	1.000***	1.000	1.000
	(8.01e-06)	(9.71e-06)	(2.15e-05)	(3.19e-05)	(3.04e-05)
Syndicate Size	0.682***	0.915	0.773	0.600***	0.603***
	(0.0275)	(0.0785)	(0.141)	(0.0606)	(0.0437)
Finance Vehicle	0.717**	0.556**	0.637	0.849	0.677
	(0.0952)	(0.138)	(0.315)	(0.258)	(0.178)
INDUSTRIAL	1.531**	1.333	3.406*	10.89***	0.698
	(0.280)	(0.390)	(2.916)	(5.988)	(0.248)
Year	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.1681	0.0922	0.1692	0.3306	0.1816
Log-Likelihood	-1560.0434	-628.7560	-123.9553	-259.0286	-462.5543
p-value ($chi^{2)}$)	0.00	0.00	0.00	0.00	0.00
Observations	2,848	1,002	220	604	1,022

Table 2.15.
Robustness on the probability of the reputable matching (Precrisis vs. crisis): Extra controls (Odds ratio)

This table presents the odds ratio and the z-statistics for the logit regressions for corporate bond issued in Europe during 2003 – 2013 including extra control variables. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter.
Robustness variables: Floated coupon is a dummy that takes the value 1 if the bond presents a floated coupon based on an index (e.g. Libor or Euribor). Currencies are dummies taking the value 1 if the whole deal has been issued in euros (€), pounds (£), American dollars ($) or in other currencies according to the specific currency-dummy. SEC is a dummy that takes the value 1 if the bond is totally sold in the USA under SEC Rule. Rule 144A is a dummy that takes the value 1 if the bond is totally US marketed via 144A. Simultaneity is a continuous variable built adding all proceeds issued in a time-window of 30 days considering the central point the issue date. A constant term (not reported) is included in all regressions. Z-statistics are based on clustered issuer standard errors. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

VARIABLES	2003 -2013	Precrisis	Crisis	Subprime Crisis	Banking Crisis	Sovereign Debt Crisis
Issue Size	1.537***	1.551***	1.541***	1.546	1.550***	1.444***
	(0.0894)	(0.158)	(0.121)	(0.473)	(0.155)	(0.173)
Maturity	1.645***	1.379**	1.718***	0.726	2.238***	1.846***
	(0.186)	(0.221)	(0.238)	(0.241)	(0.628)	(0.306)
Callability	0.830	0.855	0.934	3.041	0.778	0.928
	(0.148)	(0.260)	(0.192)	(3.286)	(0.351)	(0.232)
Investment Grade	0.950	0.787	0.984	0.115	0.786	1.047
	(0.216)	(0.328)	(0.251)	(0.364)	(0.366)	(0.348)
Nº Tranches	1.079	0.981	1.160	5.572**	1.056	1.179
	(0.0820)	(0.0720)	(0.133)	(4.523)	(0.265)	(0.177)
Total Issue	0.841**	0.931	0.770**	1.096	0.473***	0.876
	(0.0597)	(0.0819)	(0.0782)	(0.311)	(0.103)	(0.0982)
First Issuer	0.664**	0.658	0.605**	0.640	0.793	0.448**
	(0.115)	(0.194)	(0.137)	(0.479)	(0.289)	(0.153)
Firm Size	1.132	0.996	1.284**	1.224	2.017***	1.063
	(0.0959)	(0.104)	(0.134)	(0.403)	(0.419)	(0.140)
ROA	0.980	1.003	0.979	0.872	0.931*	1.011
	(0.0226)	(0.0323)	(0.0233)	(0.0859)	(0.0368)	(0.0247)
Debt to Equity	1.000***	1.000**	1.000**	1.002	1.000	1.000
	(4.68e-06)	(4.91e-06)	(1.01e-05)	(0.00130)	(3.22e-05)	(1.42e-05)
Syndicate Size	0.712***	0.920	0.662***	0.718	0.645***	0.644***
	(0.0499)	(0.125)	(0.0463)	(0.193)	(0.0710)	(0.0534)
Finance Vehicle	0.690	0.525	0.806	0.563	0.931	0.750
	(0.183)	(0.213)	(0.234)	(0.421)	(0.399)	(0.187)
Floated Coupon	0.528***	0.483*	0.542**	0.0109**	0.658	0.578
	(0.119)	(0.199)	(0.163)	(0.0196)	(0.309)	(0.216)
Curr: EUR	0.990	1.439	0.800	4.957*	3.343**	0.417**
	(0.236)	(0.503)	(0.263)	(4.655)	(1.817)	(0.171)
Curr: GBP	2.423***	7.595***	1.377	10.91*	4.736**	0.648
	(0.766)	(3.968)	(0.489)	(15.02)	(2.960)	(0.313)
Curr: Other Curr.	0.859	1.703*	0.492**	1.912	2.487*	0.275***
	(0.205)	(0.505)	(0.157)	(1.963)	(1.304)	(0.114)
SEC	1.645	1.998	1.048	0.936	4.954*	0.862
	(0.728)	(0.973)	(0.560)	(0.989)	(4.691)	(0.461)
Rule144A	1.983**	1.500	2.025*	2.168	4.868**	1.940
	(0.553)	(0.556)	(0.768)	(2.757)	(3.241)	(0.924)
Simult. 30days	1.000	1.000**	1.000	1.000	1.000	1.000
	(2.66e-06)	(3.01e-06)	(3.85e-06)	(1.74e-05)	(5.63e-06)	(5.81e-06)
INDUSTRIAL	1.497*	1.331	1.953**	9.620*	11.66***	0.825
	(0.370)	(0.550)	(0.649)	(11.99)	(6.319)	(0.327)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered Issuer	Clustered Issuer	Clustered Issuer	Clustered Issuer	Clustered Issuer	Clustered Issuer
Pseudo R2	0.1945	0.1160	0.2336	0.2575	0.3373	0.1975
Log-Likelihood	-1891.0164	-679.06974	-1160.1305	-128.09313	-337.67829	-618.82035
p-value (chi2))	0.00	0.00	0.00	0.00	0.00	0.00
Observations	3,687	1,111	2,576	251	830	1,495

Table 2.16.
Robustness on the probability of reputable matching: Non-financial and banking corporate bonds

This table presents the logit coefficients and the z-statistics (in parenthesis) for the logit regressions for non-financial and banking corporate bonds issued in Europe during 2003 - 2013. The dependent variable is a binary variable that takes the value 1 if the bond is placed by a reputable underwriter. Robustness variables: Past issuer is a dummy that takes the value 1 if the issuer has issued corporate bonds at least once 15 years prior to the start of the sample period (from 1988 to 2003). Floated coupon is a dummy that takes the value 1 if the bond presents a floated coupon based on an index (e.g. Libor or Euribor). Currencies are dummies taking the value 1 if the whole deal has been issued in euros (€), pounds (£), american dollars ($) or in other currencies according to the specific currency-dummy. SEC is a dummy that takes the value 1 if the bond is totally sold in the US under SEC Rule. Rule 144A is a dummy that takes the value 1 if the bond is totally US marketed via 144A. Public Bank issuer is a dummy that takes the value 1 if the issuer is not a sector private bank. Self&NotSelf is a dummy that takes the value 1 if the bank has in the same year issued bonds that it has placed by itself and other bonds that have been placed by third parties Simultaneity variables are continuous variables built adding all proceeds issued in a time-window considering the central point the issue date. The time-window comprises days before and after the issue date; a 90 days-window covers all proceeds issued 45 days before and 45 days after the issue date not including the specific proceeds of the deal we are considering. A constant term (not reported) is included in all regressions. Z-statistics are based on clustered issuer standard errors. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

VARIABLES	NON- FINANCIAL	BANKS
Issue Size	0.479***	0.428***
	(0.141)	(0.0743)
Maturity	0.308*	0.543***
	(0.176)	(0.134)
Callability	0.0600	-0.592**
	(0.256)	(0.295)
Investment Grade	0.258	-0.771
	(0.265)	(0.582)
Nº Tranches	0.356***	-0.313*
	(0.130)	(0.185)
Total Issue	-0.325**	-0.141*
	(0.137)	(0.0810)
Firm Size	0.380***	0.222**
	(0.136)	(0.112)
ROA	-0.0154	19.06
	(0.0164)	(22.84)
Debt to Equity	-0.00335***	4.92e-06
	(0.00116)	(7.91e-06)
Syndicate Size	-0.338***	-0.433***
	(0.0609)	(0.127)
Finance Vehicle	-0.463**	1.262**
	(0.203)	(0.615)
Past Issuer	0.228*	0.0176
	(0.166)	(0.262)
Floated Coupon	-0.736**	(0.295)
	(0.342)	-0.223
Currency: EUR	0.555	-0.453
	(0.351)	(0.367)
Currency: GBP	1.280***	0.564
	(0.408)	(0.543)
Currency: Other curr.	-0.318	-0.118
	(0.323)	(0.327)
SEC	0.304	0.791
	(0.554)	(0.957)

Table 2.16. (cont.)

VARIABLES	NON- FINANCIAL	BANKS
Rule144A	1.094***	0.502*
	(0.378)	(0.468)
Public Bank		-0.466
		(0.505)
Self & Not Self		0.201
		(0.215)
Simult. 90days	-1.05e-06	2.76e-06
	(4.38e-06)	(2.14e-06)
Year	Yes	Yes
Industries	Yes	Yes
Countries	Yes	Yes
Pseudo R^2	0.2667	0.2361
Log-Likelihood	-707.68158	-1054.9436
p-value ($chi^{2)}$)	0.00	0.00
Predicted value	0.35	0.31
Observations	1,490	2,197

CHAPTER 3

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

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 during the period 2003-2013, we show that prior lending relationships have a significant impact on the syndicate choice and that this effect is particularly significant during the crisis. We also find 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.

Keywords: Underwriters, banks, syndicate, bond, multiple underwritten

JEL Classification: G32, G21

3.1. Introduction

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

Prior literature has examined the effects of underwriting syndication for 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 the 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) to a model of less exclusive relationships with a large number 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 asymmetric information might affect equity markets more than debt markets, and also because in the equity underwriting business the entry is primarily achieved through acquisitions by investment banks (Chaplinsky & Erwin, 2009).

Some investment bankers have reported that syndication emerges from issuers' demand. In a number of deals, underwriting syndication is explained to a large extent by the decision of firms to favor their bank relationships in difficult times[24]: *"When times*

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

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."[25]

The increasing number of syndicated deals has led investment chiefs to highlight the distinction between active and passive underwriters whilst drawing attention to, from their perspective, the risk of avoiding underwriting responsibilities in large syndicates. Thus, the role of banking relationships across markets as well as how these relationships affect the inner functioning of a syndicate has become a relevant feature of debt markets in recent years. Despite these market trends, empirical evidence is still relatively sparse. Some important questions remain unsolved as to why the average underwriter's syndicate size continues to increase over time, how these syndicates are being structured, the role that an underwriter's reputation plays within the syndicates, and the related pricing effects.

In this paper, we present a broad view of debt markets and investigate the underwriting syndication trend in corporate debt issuance by non-financial companies, considering the impact that their relationships with banks have on various dimensions of underwriting syndication and on the matching of issuers and underwriters. Firstly, we explore the factors that explain the decision to appoint a syndicate and whether firms favor their lending relationships with banks when choosing an underwriter, in particular during crisis years. Secondly, we examine the size and structure of the syndicate and how they are related to existing bank-firm relationships. Third, we explore the impact of the syndicate structure on bond pricing.

Our analysis contributes to the extant literature on issuer-underwriter matching by explaining how issuers' relationships influence the decision on whether to syndicate the

[25] The term "bookrunner" is also employed because the method mostly used in debt placement is "at the 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.

issuance or remain with a sole underwriter as well as on the structure of the syndicate formation. Additionally, this paper explores how the concentration of these relationships affects the underwriting choice before and during the crisis. Regarding the syndicate structure, this study particularly contributes to the literature on syndication by examining how underwriters' reputational concerns on debt markets may drive the syndicate formation.

Our analysis relies on a sample of 1887 corporate bonds issued in Europe during 2003-2013. Although the underwriting syndication trend is not exclusive to Europe, it has been most observed during the European banking crisis in debt markets. Furthermore, the larger dependence of European companies on the lending market compared with U.S firms is likely to reflect to a larger extent the effects of bank-firm relationships on underwriting syndication. The research period allows us to control for the effects of the 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 of all, we employ probit models to explain the choice of a syndicate and the likelihood of being appointed as underwriter. Following Sufi (2007), the issuer-underwriting matching model contains one observation for every potential underwriter of each bond, thereby allowing multiple choices and correlation across all the eligible underwriters in a specific deal. We then use a count data model to explore the syndicate size. We also use an additional probit model to examine the determinants of the syndicate structure, treating each underwriter in a syndicate deal as a different observation. We thus examine syndication from the perspective of the underwriter, providing a better understanding of the role that factors such as underwriter reputation and/or issuer-underwriter relationships may have on the

syndicate formation. Finally, we use a Heckman selectivity model that accounts for self-selection to investigate the impact of the syndicate choice on bond pricing.

By way of preview, the results suggest that the syndicate choice is influenced by the strength of the relationship between the issuer firm and its lenders. Firms that hold 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 also affect the syndicate formation as more reputable underwriters are less likely to join a syndicate if their potential syndicate partners are less reputable underwriters. 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 2 reviews the related literature. Section 3 describes the dataset. The hypotheses and the methodology employed are explained in section 4. Section 5 discusses the main empirical results. Section 7 concludes.

3.2. Related literature

In spite of the recent evolution of multiple underwritten bonds, a growing body of literature has studied this phenomenon in equity and debt markets. The main determinants of multiple underwritten IPOs have been examined in a seminal paper by Hu & Ritter (2007). Using a bargaining model, they predict that underwriters accept to jointly run an IPO when the issue size is large enough to ensure that the transaction is profitable ("size hypothesis"). Empirically, they find that the increasing percentage of this kind of IPOs is explained by larger issuances, the significant reduction of IPOs after 2000, a decreased importance in all-star analyst coverage and the increased number of buyout-backed IPOs. Jeon, Lee, Nasser & Via (2015) study 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 & Schultz (2005) examine the role of IPO syndicates, concluding that both the number of underwriters and the number of co-managers increase with a deal's proceeds while venture backed firms are associated with more co-managers. Consistent with the size hypothesis, Gunay & Ursel (2015) and Shivdasani & Song (2011) find that larger issues are more likely to have more underwriters. They find that firms that have previously appointed a commercial bank as co-manager with loans from underwriters belonging to industries with a deep bank penetration are more likely to employ a syndicate. Jo, Kim & Shin (2012) find that inefficient firms – in terms of corporate governance – are associated with large SEOs 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 with "risk-sharing", suggesting that offering size is related to more risk. However, other studies, such as Corwin & Schultz (2005), do not find evidence of riskier offers being handled by larger syndicates.

To gain further insight into underwriting syndication it is relevant to consider the related strand of literature that examines how the formation of a syndicate affects its functions[26]. Pichler & Wilhelm (2001) propose a syndicate theory relating the organizational form of syndicates with moral hazard[27]. They argue that the syndicate's organizational structure is a consequence of the central role of relationships and reputation, in which the structure serves to alleviate the moral hazard problem. Relationships between banks are critical in the syndicate formation because they help to

[26] A range of studies has analyzed the syndicate formation through the perspective and 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).

[27] 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).

mitigate free riding and moral hazard problems (Corwin & Schultz, 2005). Therefore, the underwriters' certification role is enhanced through the syndicate. However, contrary to the certification hypothesis, in a highly competitive context Shivdasani & Song (2011) find that syndicated deals are more likely to experience financial misconduct evidenced by shareholder litigation and earnings restatements after the offering. They argue that these findings are consistent with a relaxation in their screening and certifying functions in the context of the entry of commercial banks into the business.

In addition, it seems that syndication could be affected by the prior relationships, historical and social performances that influence its formation. Chung, Singh & 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 able to complement their weaknesses. However, they also suggest that "status similarity" of 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 & 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 efforts shared among the underwriters. Furthermore, the competition in the investment industry structure and investment banks' networking relationships also seems to affect the syndicate composition. Asker & Ljungqvist (2010) argue the existence of fluxes of information between issuers and banks due to underwriting securities in the capital markets, in which firms prefer to avoid sharing banks with direct product market rivals, while Huang,

Shangguan & Zhang (2008) show that investment banks' networking with investors has implications on firms when deciding whether to employ an investment bank.

As for the strand of the literature more specifically related to the purpose of our investigation, from the issuer-underwriting matching perspective, a number of studies have found that not only reputation but also the existence of previous lending relationships positively affect 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 expelled in a subsequent offering. These studies also show how firms' relationships carry over across different transaction types like lending, underwriting, mergers and acquisitions. However, most of them suggest that lending relationships affect the choice of an underwriter but not the opposite. Chen, Ho & 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 the underwriting matching and the syndication choice from a relational perspective, these studies connect with the strand of literature focused on the nature of investment banking relationships (Corwin & Stegemoller, 2014; Morrison et al., 2014).

While some studies cover the main determinants of syndicated deals and how relationships affect their formation, there is little evidence in the literature examining whether syndicate size comes to a cost for the issuer. In a recent paper, Levis, Meoli & Migliorati (2014) find that syndicate size had no effects on charged underwritten fees in UK SEOs during the financial crisis. Peristiani & Santos (2010) analyze the U.S and Eurobond market in order to provide evidence about the gross spread evolution in these markets. They find a statistically significant negative effect of the number of underwriters on the Eurobond market fees during 1995-2006. In the most specific study on this issue,

Shivdasani & 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 we are the first empirical study that gives an explanation for the debt underwriting syndication phenomenon by examining how issuers' relationships as well as underwriters' reputational concerns influence the syndicate formation. Secondly, we find that the concentration of these relationships had a different effect on the underwriting choice before and during the crisis. Finally, we find that during the crisis, due to inverse relationships between those factors that favor the syndication choice and at-issue bond yield spreads, issuers self-selected into a sole or syndicated deal and that self-selection led to lower spreads.

3.3. 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, regulated (SIC: 4000s) or financial firms (SIC: 6000s). We also exclude deals not reporting information about the underwriter parent and issue rating at launch at least for one tranche. The sample period allows us to explore pre-crisis, crisis and post-crisis years.

Firstly, in order to control for issuer characteristics, we match the Dealogic dataset with the information provided about the issuer by Compustat Global. We are able to match each bond issuer with its main accounting information. 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[28]. This provides a unique sample with detailed information about bond characteristics, issuer characteristics and lending relationships. In order to track down issuer-bank relationships we account for mergers and acquisitions between underwriters during the sample period. We collect information on M&A activity from Thomson ONE, Lexis-Nexis and banks' own information sources[29]. The database construction and some summary statistics for the sample distinguishing between bond, issuer and syndicate features are offered in Table 3.1. In our framework, the crisis period covers from September 2008 until December 2013. This extended crisis period, compared to the U.S., serves to account for the interbank liquidity crunch and the firm credit crunch in Europe. Furthermore, in terms of quarter-on-quarter changes of seasonally adjusted real GDP, the recession ends in 2013 for Europe. Our final sample includes 1505 deals – structured in 1887 tranches – by 345 unique issuer parents involving 90 underwriters largely representing the European corporate bond markets[30].

Table 3.2. reports the yearly distribution of the sample by number of underwriters. The results highlight the evolution in the number of underwriters placing non-financial corporate bonds over time. Our sample results confirm the increase in the number of underwriters previously reported[31]. The so-called "multiple underwriting" trend is observed. In 2003, the average number of lead underwriters by tranche was 2.5, while in 2013 this average was close to 4. During the period 2003-2005, around 20% of corporate

[28] Issuers' identification indicators provided by Dealogic are used to match both databases.
[29] 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 from absorbs all relationships from both predecessor banks. For exemplification purposes in the Appendix we report the lifetime of two banks that were involved in M&A: Credit Agricole CIB and Commerzbank.
[30] The geographical distribution of the deals is as follows: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Spain, Sweden and United Kingdom.
[31] Dealogic reported 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."*

bonds were placed by one lead underwriter, while in 2013 this average was close to 10%. Also, this table shows the rise in terms of volume in the European corporate bond market from 2009.

Together with the multiple underwriting phenomenon, prior studies have reported an increase in the number of relationships that firms hold. While in the past firms mainly had a relationship with one sole bank, nowadays relationships are less exclusive as firms hold relationships with several banks (Corwin & Stegemoller, 2014). Figure A.3.1. 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.3.2. reveals that nowadays firms' relationships are less concentrated on a few underwriters.

3.4. Hypotheses and methodology

3.4.1. The effects of firms' relationships on syndicate decision

We aim to explore how the strength of firms' relationships might affect the choice of syndicate-underwritten vs. single-underwritten bonds. 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 on how these relationships might influence the decision on whether to syndicate the issuance or remain with a sole underwriter as well as on the structure of the syndicate formation. Throughout their existence, firms hold relationships with banks even though these transactions may be more or less concentrated. Acknowledging that firms' prior relationships affect the matching, we argue that

syndicated bonds are likely to differ by the strength of the issuer's relationships. Holding an exclusive relationship with a single bank or, conversely, with several banks, is likely to generate differences in the decision whether to syndicate or not. Based on the desire to avoid informational spread among syndicate underwriters (Asker & Ljungqvist, 2010) and a potential low certification effort as the syndicate size increases (free-riding problems), we argue that it could be expected that firms that hold strong relationships are less likely to employ a syndicate if they perceive that holding exclusive relationships is more beneficial. Moreover, establishing a new banking relationship is initially costly (Boot, 2000) so these firms would not consider that alternative if they do not foresee any kind of hold-up problems. In contrast, those firms with extensive relationships would be more prone to employ a syndicate as a way of continuing to enjoy the benefits from diversification associated with multiple banks.

A first methodological reference to our empirical study is the choice of single underwriter vs. multiple underwriter of the bond. As in prior studies, (Corwin & Schultz, 2005; Hu & Ritter, 2007; Jeon et al., 2015; Shivdasani & Song, 2011; Song, 2004), the empirical strategy for addressing this question consists of estimating a discrete choice model in which the likelihood of issuing a syndicate-placed bond (rather than a single underwriter choice) is explained by deal, issuer and syndicate characteristics.

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

(1)

in which $X_{bond\ features}$ is a vector of variables containing characteristics of the issuer company, $X_{issuer\ features}$ is a vector of variables reflecting the bond'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.

Our baseline hypothesis is defined as follows:

H1: *The existent bank-firm relationships at issuance affect the decision on whether or not to syndicate a bond*

Most of the 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. Different kinds of underwriters have relationships with different sets of investors[32]; therefore, adding more underwriters ensures enlarging the base of potential investors. As distribution capabilities are strengthened, it is expected that the deals that entail more placement complexity will be underwritten by several banks. In this sense, bond characteristics are particularly important in explaining the syndicate size. The natural logarithm of the deal proceeds is used as proxy of the *bond size*. The complexity of the marketing, pricing and selling activities increases with the size of the offering. *Bond maturity* – the natural logarithm of the years to mature – is also included in the equation to capture how the relationship between maturity and risk affects the choice. A dummy for callable bonds is also considered. Furthermore, we have included proxies of issuers' quality, *bond rating* and

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

i*ssuer rating*[33] to test the impact of bond and issuer quality on the choice of single- versus syndicate-underwritten deals. It could be the case that issuers employ the syndicate to place low-rated bonds as a sole bank would reject taking all the risks of such a deal. Conversely, Shivdasani & 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, along with issuers' ratings, we also include *firm size*, as the natural logarithm of the total assets of the company at the end of the year before the issue. In order to assess how the financial structure of the company could affect influence we include a proxy for firm *leverage,* measured with a debt-to-equity ratio and firm profitability, measured by the *Return on Assets (ROA)*[34]. We also account for issuer experience in the capital markets, including the dummy *first-time issuer* - taking the value 1 if the issuer did not issue any corporate bond from 1988 to 2003 and zero otherwise. 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 the specialization issuing debt instruments of finance vehicles might affect the syndicate formation. Their own specialization may lead them to require a lower number of underwriters. As prior studies suggest that underwriters could have been substituted by adding extra co-managers, we include the *number of co-managers* as an explanatory variable. Furthermore, we control for *Underwriter reputation*, proxied by the average market share of the underwriters,[35] since a number of studies have agreed on reputation being determinant in the matching (Benveniste et al., 2003; Drucker and Puri, 2005; Hoberg,

[33] Bond rating and Issuer rating are included in separate regressions to avoid multicollinearity problems due to their correlation (Variance Inflation Factor between Bond rating and Issuer rating = 18.08)
[34] All the accounting values were collected at the end of the year before the issuance.
[35] Market shares are collected from Annual League Tables provided by Dealogic. In multiple underwritten deals proceeds are equally apportioned among the underwriters.

2007; Kanatas and Qi, 2003; Ljungqvist et al., 2006; Yasuda, 2007; Fernando et al,. 2015; Fernando et al., 2012). Consistent with extant studies (Bharath et al., 2007; Drucker and Puri, 2005; Duarte-Silva, 2010; G. Kanatas and Qi, 1998; Ljungqvist, Marston and Wilhelm, 2006) prior ties with an underwriter affect current underwriter choice. We account for prior underwriting relationships controlling whether the current underwriter was previously appointed as bond underwriter. We also consider other kinds of prior ties, such as co-manager. Furthermore, since studies on the effects of cross-market relationships have documented the relevance of previous and concurrent lending relationships as determinants of the matching, we include a variable that controls for prior lending relationships between the issuer and the underwriter. Finally, we have also accounted for the "timing of the issue" with the dummy *simultaneity* that captures whether there was a high volume of offerings in the European capital markets at the issue date. In this sense, Gunay & Ursel (2015) argue that in periods in which offerings are highly concentrated a relationship with an underwriter helps the issuer to ensure access to underwriting services.

Another fundamental issue is the impact of the crisis on the choice of sole vs. syndicated deals. We formulate a second hypothesis as follows:

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

The recent financial crisis may help to explain a switch to a syndicate choice for firms that were highly dependent on single-bank relationships before the crisis. Farinha & Santos (2002) show that firms switch from single to multiple relationships when they are concerned about hold-up costs. In this sense, Gopalan, Udell & 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 (Sette & Gobbi, 2015) but the climate of uncertainty and credit contraction is likely to awaken interest in reducing their single banking dependence.

The financial crisis may have accentuated how firms perceive the risks of hold-up problems associated with exclusive relationships. This would be in line with (Gopalan et al., 2011)'s findings on access to credit and capital market services. In this sense, we expect that the perception of firms that a banking and financial crisis exposes them to credit restrictions is likely to alter the decision of choosing a syndicate rather than a sole underwriter. It is important to note that we do not explore the role of bank-firm relationships in choosing syndicated underwriting, which according to the literature increases the likelihood of choosing a syndicate. What we examine is how the concentration of these relationships affects the underwriting choice before and during the crisis. The crisis effect is considered by interacting our variable of relationship strength with a crisis dummy that takes the value 1 for issues made from September 2008 to December 2013.

Thus, in order to account for this fact, we have used a measure of bank relationship strength (a relational Herfindahl Index). This index is built for each issuer at the issue. In doing so, we track all the loans granted to each issuer in the two years previous to the bond issuance[36]. We calculate the portion of the issuer's total loan proceeds for each loan supplier that lead managed[37] at least one loan for that particular issuer. And finally, we sum the square values of these "market shares" to obtain the relational Herfindahl Index. A large value would mean that the issuer has highly concentrated lending relationships.

[36] In reported regressions, we use an alternative measure considering a larger time window (3 years before the bond issuance). Results remain robust after using a three-year window.

[37] Using measures of bank relationship strength based on prior bond issuances would not be appropriate. Firstly, because that way of proceeding would introduce endogeneity in our model since prior syndication choices will affect the Herfindhal considered in later bond issuances. And secondly, because lending restrictions during the crisis are what accentuated the risks of hold-up problems.

After examining how a concentration of firms' relationships affects the decision to syndicate, another important, related issue is which underwriter is chosen from among the set of potential banks. Which banks are more likely to underwrite the offering? Here we explore the role of bank-firm relationships in being chosen.

Although these relationships increase the likelihood of being chosen (Bharath et al., 2007; Drucker and Puri, 2005; Duarte-Silva, 2010; G. Kanatas and Qi, 1998; Ljungqvist, Marston and Wilhelm, 2006) their impact on the choice might differ over time. Regarding credit supply, there is evidence of the greater effects of relationship lending when firms are exposed to financial uncertainty and difficulties (Sette & Gobbi, 2015). Prior studies have also shown that relationships have been valuable during the recent financial turmoil[38]. Moreover, since the crisis emerged the investment banking industry has argued that a rewarding mechanism that was put into practice might explain the multiple underwriting phenomenon. Some investment bank chiefs report that, during the financial crisis, appointing a lending relationship bank as underwriter was more likely than before. 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 rewarding relationships without compromising the execution of the transaction"*[39]. This way of proceeding would have led firms to respond to the gesture, including them as bond underwriter because it "*is an easy and also very visible way of rewarding them".* That therefore implies that lending to a firm during a banking crisis, in which there are credit constraints, is valuable for the bank because it then translates into winning future underwriting mandates. This leads us to explore our hypothesis on the

[38] See among others Alexandre, Bouaiss & Refait-Alexandre (2014); Dewally & Shao (2014); Kahle & Stulz (2013).
[39] Extracted from the Financial Times (Gavin Jackson, 17 June 2015) Banks prosper from euro company debt rush. www.ft.com/markets

effects of firms' relationships on syndicate decisions before and during the financial crisis.

In order to address this issue, we have built 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.

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

(2)

We use a probit model to examine the issuer-underwriter matching probability, accounting for bond, issuer and underwriter features. Our dependent variable is a dummy taking the value 1 if the bank is chosen among the set of potential underwriters. Instead of using a conditional probit model, we use a probit model since more than one underwriter could be chosen on a bond. 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 correlated. This could be solved using a nested model if there were just sole underwritten deals in which each issuer chose just one underwriter, which is not the case we are studying. Using Amemiya (1974) as starting point, who considers that the desirable technique in a situation like ours is to estimate a probit, we follow Corwin & Schultz (2005) and Sufi (2007), and employ a 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 mergers and

acquisitions 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 or not another underwriter is chosen on this same deal. We therefore allow for correlation across all the eligible underwriters in a specific deal.

We employ three variables that capture the existence and strength of previous lending relationships between the issuer and each bank from 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 underwriter bank was appointed as Lead Manager. These market shares are computed splitting the loan value equally between all lead managers in multiple syndicated loans. Then we use a discrete variable named *Prior Lender* which takes the value 1 if the underwriter bank has taken the role of Lead Manager in a previous issuer's loan. After that, our measure *Max. Relationship Lende*r captures the strength of the issuer-underwriter relationship. It is a dummy, taking the value 1 if the underwriter for the issuer is the bank with the largest lender market shares. If more than one underwriter holds the same largest market share, then none of them is considered the *Max. Relationship Lender*, thus the dummy takes the value zero. In our analysis we examine these relationships in a two-year window before the issuance date, consistent with related studies on prior relationships (Sufi, 2004)[40]. For robustness purposes, in order to capture better the effect of closer lending relationships in the crisis scenario, we subsequently consider a one-year window.

Furthermore, as previous underwriting relationships also affect the underwriting choice, we include *UW Mkt. Share, Prior UW and Max. Relationship UW,* which are respectively the proportion of the firm's total bond proceeds issued for which the

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

underwriter bank was appointed as Underwriter, a dummy taking the value 1 for previously appointed underwriters, and a dummy taking the value 1 if for the firm the underwriter is the one with the largest underwriter market share. We expect them to be positive and statistically significant.

Besides this, and consistent with prior literature, we control for others factors likely to affect the matching. Together with those bond and issuer characteristics that influence the matching, we have considered some underwriter characteristics. Reputation attracts business, which is why we expect a positive and significant coefficient for *underwriter reputation*, which is built using the market shares on apportioned proceeds[41]. Furthermore, as geographical proximity[42] also affects the matching between the issuer and the underwriter, we consider *shared nationality,* which is a dummy taking the value 1 if the underwriter and the issuer are located in the same country. In addition, underwriter industry specialization is likely to generate information spillovers if there is a concentration of issuance in an industry during 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 including a measure of *underwriter industry specialization*[43]. In the literature there is mixed evidence: Dunbar (2000) reports that for well-established and reputable underwriters diversification is beneficial. Finally, the impact of the crisis on the underwriter choice is captured by the interaction of the main explanatory variables with the crisis dummy.

[41] 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.

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

[43] *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.

3.4.2. The syndicate formation: Determinants of the syndicate size

After studying the syndication vs. sole-underwriting choice as well as the determinants of being chosen as underwriter, we are interested in studying how syndicates are set, and how reputation can affect the syndicate formation.

Firstly, we examine what the main determinants and features of the syndicate size are. As before, the empirical strategy for addressing this question consists in estimating a model capable of explaining the syndicate size. Consistent with prior literature, we employ models in which the likelihood of issuing a syndicate-underwritten bond is explained by deal, issuer and syndicate characteristics. All the variables contained in $X_{bond\ features}$, $X_{issuer\ features}$ and $X_{syndicate\ features}$ accounting for characteristics of the bond, issuer and syndicate, respectively, have been discussed above.

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

Now, in our model the dependent variable is the number of banks appointed as underwriters in a deal, so it takes integers from one to sixteen – the largest underwriter syndicate in our sample. A zero-truncated Poisson model designed for count data, in which the dependent 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 fit the models by including probabilities for zero values even though there are no zero values in our data. Moreover, a zero-truncated negative binomial would be desirable if there were over-dispersion in our data in addition to zero truncation, which is not the case. Together with this count data model, since the theory suggests issuers could be in a sole underwritten deal regime or in an underwriting

syndication, we employ a two-stage estimation methodology[44]. 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 the syndicate size in multiple syndicated bonds using an OLS method. In this second stage we include the inverse Mills ratio to correct for self-selection bias.

3.4.3. What determines joining an underwriting syndicate?

In the second stage we 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 related to bond characteristics, while there is little evidence on the underwriter 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 underwriter's perspective[45]. Corwin & Schultz (2005)[46] and Tunick (2004)[47] report, from 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. First of all, this is mainly because a sole underwriter collects all the fees. Secondly, because not being a sole underwriter penalizes them when league tables are computed. In the case of syndication, the proceeds

[44] Detragiache, Garella & Guiso (2000) employ a similar two-stage estimation strategy to examine the optimal number of banking relationships that a bank employs.

[45] Prior literature has recognized the importance of previous and current relationships on the firm-underwriter matching. Seminal papers about the "relationship specific capital": (James, 1992; Rajan, 1992). Empirical papers (Burch, Nanda & Warther, 2005; Drucker & Puri, 2005; Rajesh P. Narayanan et al., 2004; Roten & Mullineaux, 2002; Schenone, 2004; Yasuda, 2005)

[46] Corwin & Schultz (2005)*: "As one investment banker told us, 'if we're the lead [underwriter], the best number of co-managers is zero'."*

[47] 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."*

are shared between all the syndicate underwriters even if the others were passive underwriters. This is not trivial since there is evidence on the importance in terms of reputation of published "league tables" (Ang & Zhang, 2004; Golubov, Petmezas & Travlos, 2012; J. Griffin, Lowery & Saretto, 2014; Jeon et al., 2015). However, although a joint-underwriting appointment is tempting because a joint role is better than being excluded, there are also some factors likely to restrain them from engaging in the deal. Consequently, with this perspective in this section we investigate what determinants affect the decision of joining a syndicate.

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 an underwriter perspective. Furthermore, we consider that this way of proceeding offers a better understanding of the issuer-underwriter matching. Within the syndicate, we are able to disentangle the specific ties between the underwriters and also between the issuer and each underwriter. In our specification, we include bonds and issuers' features and, in particular, underwriters' characteristics.

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

As discussed earlier, previous studies highlight the concerns of underwriters for maintaining reputational status. Reputation is crucial for underwriters in capital markets. Reputable underwriters are believed to reduce information asymmetries more efficiently as credible certifiers (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 forming a syndicate when their reputation may be at stake. Nevertheless, as suggested by Shivdasani & Song (2011), the increased competition in the underwriting industry could have partially removed the reputational

concern, leading reputable banks to accept enrolling in a joint-underwriting deal despite assuming that their reputation could be at stake. The effect of reputation in the syndicate formation is likely to be present. In line with a long 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 avoiding putting the deal success and consequently their reputation at stake is what motivates this way of acting. 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*

As part of our identification strategy, we include variables that measure the underwriter reputation compared to average market standards. Large values of this variable mean that the underwriter is relatively more reputable than an average underwriter in the market. In this sense, consistent with the certification hypothesis that reputable banks are highly concerned to maintain their reputation, we expect that as distance increases banks would be less likely to join in a syndicate.

$$\text{Underwriter}_i \text{ Reputational distance} = \frac{Mkt\ share_{i,t} - \overline{Mkt\ share_t}}{Standard\ De\quad MS_t}$$

Additionally, the relative weight that the bond entails for each underwriter is considered on a monthly basis[48]. If this ratio is close to 1, it means the underwriter is putting all its current underwriting capacities on that specific bond. We expect a negative

[48] This measure is monthly because the underwriting process lasts around 4 – 5 weeks without including the market stabilization phase. However, we also considered other time windows in unreported regressions. After considering a week and a quarter- time window results remain robust.

sign. Firstly, due to capacity constraints, if an underwriter is busy placing many bonds simultaneously it would be more prone to accept joint-syndicates. And then, if a bond takes all an underwriter's attention, it is likely to argue that it would put their best know-how into it, so a joint syndication would be undesirable as their efforts for the issuer are less visible in a syndicate.

$$\text{UW Rel. bond weight}_{i,h} = \frac{Total\ proceeds_{i,h}}{Total\ proceeds_{i,h,m}}$$

Following Hu & Ritter (2007), we include an adaptation of their "*relative pipeline*" 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. We also consider their *DistanceMS* variable. A negative coefficient would be interpreted as that, given the bond size, reputable banks are less likely to be part of the syndicated deal. Finally, in order to check the effect of the reputation in the syndicate decision we interact UW Reputational distance and DistanceMS with a dummy that takes the value 1 for the Top 5 reputable underwriters[49].

$$Relative\ Pipeline = \frac{\frac{Nº\ bonds\ in\ process}{Total\ nº\ of\ bonds\ the\ UW\ has\ issued\ in\ year\ t}}{UW\ market\ share\ x\ Total\ Proceeds\ issued\ in\ all\ Fixed\ Corp.Bonds\ in\ year\ t}$$

$$DistanceMS_i = \frac{Mkt\ share_{i,t} - \overline{Mkt\ share_t}}{Standard\ Dev\ MS_t} - \frac{Bond\ Size - \overline{Bond\ Size_t}}{Standard\ Dev\ Size_t}$$

[49] We use a Top 5 UW because it could 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 hold a market share (37.37%) similar to the Top 5 in Europe (32.87%). However, for robustness purposes we have also employed a Top 7 dummy and results are similar.

3.4.4. 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 together with the chance 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 partially a response to issuers' demand. However, we wonder if there is a trade-off between the potential benefits and the funding costs of choosing multiple underwritten deals. It could be argued that multiple underwritten deals would have to pay an extra cost if investors believed those deals had a reputation problem originated by low screening. If, as we expect, reputable banks are less likely to join a syndicate when their reputation might be at stake, we can conclude that the syndicate formation is driven by underwriters' concerns for maintaining reputational status. That reputational concern might relax as syndicate size increases, since large syndicates are on average less reputable. Furthermore, since the crisis emerged the role of lending relationships on the 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 the underwriting choice, we would expect to find this effect for syndicated bonds due to the self-selection. In order to address this 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:

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

2nd stage:

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

3.5. Results

3.5.1. The effects of firms' relationships on syndicate decision

Table 3.3. 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, these tests reveal that bonds placed by more than one underwriter are significantly different from those placed by just one bank in several aspects. In particular, multiple underwritten bonds appear to be large in size[50]. We also find that callable bonds with longer maturity are more likely to have multiple underwriters. This is consistent with our expectations that

[50] Shivdasani & Song (2011) and Jeon, Lee, Nasser & Via (2015) obtain similar results for issue size using also mean- and median-difference tests for corporate bonds and IPOs respectively.

long-term[51] and callable bonds are more complex in order to bring them into market. It is also worth noting that domestic bonds are mostly placed by just one underwriter while international bonds are 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 sense. At the issuer level, multiple underwritten bonds are frequently issued by larger firms, in terms both of total assets and market capitalization. However, firms placing their bonds with just one underwriter are more frequent issuers no matter if the issuance is computed at a subsidiary or a parent level. Additionally, issuers that during the same natural year have obtained a loan as well as issued a bond 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 the average syndicate reputation, using market share as an accurate proxy for reputation[52], this seems to be larger for multiple underwritten bonds. However, the highly reputable underwriters, the Top 3 underwriters, 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 3.4. In order to address the potential correlation in the residuals, since in our sample some firms issue several bonds, we allow for firm-

[51] Shivdasani & Song (2011) also find that bonds with longer maturity are more likely to be placed by more than one underwriter.

[52] 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)

specific effects 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 large issues entail a higher complexity to be placed among investors because greater distribution capabilities are required. In large proceeds bonds, hiring more underwriters is believed to facilitate the distribution because that 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 result supports the view that the smaller distribution efforts of domestic deals would justify choosing just one underwriter rather than a syndicate[53].

There is no evidence suggesting that firm size[54] 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 substitution effect in Jeon et al. (2015). In contrast to Shivdasani & Song (2011), who report a lower underwriter reputation in syndicate deals, we find that, after controlling for other factors, the syndicate reputation is not statistically different between sole and multiple underwritten bonds. 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 but they also participate in syndicates. We then examine who their counterparts are in multiple underwritten bonds. Furthermore, bond and issuer ratings are

[53] Alternatively, for robustness purposes in unreported regressions we have included a dummy for international marketed bonds - 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 a higher complexity, choosing multiple underwriters is justified.

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

not significant; therefore, sole underwritten deals are not likely to be related to high-quality firms or high-quality issuances. It seems that underwriting syndication is not used exclusively by low-quality issuers searching for more certification. Additionally, previous underwriting and lending relationships between issuer and underwriter are found to be significant determinants of multiple underwritten deals. Finally, we find that when there is a great volume of simultaneous debt issuance, multiple underwritten deals are more likely. As in Gunay & Ursel (2015), this result is consistent with their prediction of underwriters limiting their capacity to produce when the market is "hot" as a non-price competition strategy.

Finally, regarding our hypothesis on how the strength of firms' relationships might affect the choice, our findings confirm the predictions. The syndicate 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. It seems that these firms might be less inclined to syndicate. Nevertheless, during the financial crisis, as predicted, the opposite effect is found. When the crisis emerged, those firms with very concentrated lending relationships, then with a high relational Herfindhal Index, were more likely to syndicate the bond. Therefore, while in the past holding exclusive relationships with few underwriters led firms to opt for sole deals, during the crisis that 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.

After examining how a concentration of firms' relationships affect the decision to syndicate, Table 3.5. shows the results of which banks among a set potential underwriters are more likely to underwrite the 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. We obtain a similar result using a dummy variable for the Top 5 and 7 underwriters in the annual league tables. Furthermore, contrary to information spillover theories, as 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 location with the issuer are more likely to be appointed as underwriters. In Columns 2-4 all the variables reflecting the existence and strength of prior underwriting relationships are included. All the coefficients are positive and significant, which means that during the whole research period underwriting choice was positively influenced by prior underwriting relationships. These results confirm the importance of past relationships within the bond market.

All the coefficients measuring the effects of previous lending relationships on the choice are positive and significant. These findings confirm our initial hypothesis: firms are more likely to choose as underwriters the banks that hold lending relationships with them. As for the economic significance of lending relationships in columns 5 and 6, we report the marginal effects, multiplied by 100, of being a prior lender and the relationship bank. 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 chosen probability by 5.85 percentage points (3.72 percentage points). These findings show that lending

relationships have a higher weight on the underwriter matching probability than the underwriting relationships themselves. Therefore, as a number of studies have documented, there are effects from cross-market relationships, with firms' relationships carrying over across lending and debt transactions.

The effects of lending relationships on the underwriter choice during the financial crisis are shown in Table 3.6. In Columns 1-3 we include interaction terms between the relationships variables and a crisis dummy. These findings suggest that holding lending relationships with a firm during the crisis increases the probability of being chosen as an underwriter to a significantly larger extent than in the pre-crisis period. For robustness purposes, in Column 4 we shorten the time window considered for lending relationships to one year. By doing so, we ensure that our results are not biased by the chance that firms may strategically change their relationships at the onset of the crisis. Results remain robust after considering a shorter time window.

As for the economic significance of these results, Table 3.7. shows the average adjusted probabilities. We find that the bank holding the closest lending relationship with the bond issuer – that is, the main loan provider – increases the probability of being chosen by 11 points (124%) during the crisis compared to the pre-crisis period. Further, if a non-lender bank before the crisis becomes the closest lender for a firm during the crisis, the probability of being chosen is even larger, at 14 points higher (246%). As can be seen in Table 3.7., 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 conclusion, the overall results of Tables 3.5. and 3.6. 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 are likely to affect firms' choice in what regards 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 multiple underwriting syndication in Europe is best explained by the strengthening role of lending relationships on underwriter choice. In consequence, the increased likelihood 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 the gaining of market shares of mid-tier commercial banks.

Finally, we have rerun our models including some robustness controls. For the sake of brevity we report only the coefficients of the key explanatory variables, although the model is estimated considering all the variables of Tables 3.5 and 3.6. In Column 1 – 3 of Table 3.8. we present the model excluding from the set of eligible underwriters those that issued lower than 1% of the total deals in the year of issue. Results remain robust. Moreover, we also explore the effect of relationships during the financial crisis, distinguishing whether the firm is a recent borrower (firms that took out a loan the year before the bond issuance) or not. In Columns 4 and 5, we find that even though the effects of lending relationships are present for both kinds of firms, these effects are larger for recent borrowers. Thus, these results confirm the importance of lending relationships during the crisis and show that those receiving recent supporting credit are even more important.

3.5.2. The Syndicate formation: Determinants of the syndicate size

As Figures A.3.1. and A.3.2. show, simultaneously with the underwriting syndication trend, firms have moved from a more exclusive banking relationship to multiple banking relationships. Therefore, differences are also likely to appear in the syndicate size. Consequently, then, we investigate the determinants of the number of underwriters in the syndicate. Table 3.5. reports the coefficients and z-statistics based on issuer clustered standard errors for the number of underwriters. In columns 1 and 2 we have included the same regressors as in Table 3.4. Supporting the need of higher distribution capabilities, syndicate size increases with bond size while decreasing for domestically placed bonds. Consistent with prior literature that argues that issuer-underwriter relationships are capable of explaining the matching, we find that in large syndicates it is more likely to observe banks that have been previously appointed as co-manager, underwriter or lender by the issuer. Additionally, in the zero-truncated Poisson estimations all the coefficients of the variables used as proxy for possible issuer-underwriter relationships are positive and statistically significant.

Conversely, in both alternative specifications, 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 3.4. Taken together, both results suggest that differences in reputation appear as syndicate size increases. Furthermore, bond rating and issuer rating become statistically significant, indicating that large syndicates placed debt from lower quality issuers with lower ratings. These results provide additional insights into the syndicate formation. These results are confirmed in the second-stage estimations shown in Table 3.9. While prior results show that there are no differences in terms of reputation and quality between sole underwritten deals and syndicated deals, these latter findings suggest that differences appear between small and large syndicates.

Acknowledging that categorizing a variable could be statistically problematic, for robustness purposes we classify bonds into 4 groups according to the 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 syndicate (4 - 5 underwriters) and large syndicates (more than 5 underwriters). All the ancillary or threshold parameters are significantly different from each other, confirming that the categories cannot be combined into one. In the last columns of Table 3.9. it is shown that large syndicate deals are formed by less reputable underwriters with lower bond and issuer ratings[55]. Finally, as shown in Table 3.10., these findings are confirmed by checking for statistical differences between groups in means (t-statistics).

Shivdasani & 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 a lower underwriter reputation and poor credit ratings. Our findings suggest that multiple underwritten deals are associated with lower 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 usual. However, the relaxation in the certifying function might not appear by the fact of employing a syndicate but for employing a syndicate with a large number of underwriters, 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 each other's efforts. However, this problem is more likely to arise in large syndicates in which the presence of passive underwriters is recognized. Therefore,

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

complementing Shivdasani & Song (2011), it could be argued that reputation, proxied by underwriters' market share, is less important in large syndicated deals.

This possible explanation coincides in this regard with the industry claims about appointing banks 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 the syndicate size increases are likely to explain a lower reputation. The decrease in reputation as syndicate size increases might be explained if, as the industry claims, these extra underwriters come from the lending industry. They are less reputable in the underwriting industry because they come from the lending industry, mainly commercial banks. Therefore, if nowadays, as some investment bank chiefs have reported, it is more likely to appoint as underwriter a bank with lending relationships, which could explain why large syndicate deals are less reputable.

3.5.3. What determines joining an underwriting syndicate?

Panels B and C of Table 3.10. offer some descriptive statistics of syndicated deals. Overall, these results confirm that while syndicate reputation is not statistically different in small and medium syndicates, large syndicates are statistically 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 the syndicate reputation, measured using underwriters' market shares, is lower for large syndicates, as can be seen in Figure A.3.3. standard deviation increases as the syndicate size does, reaching a maximum of 4 underwriters per bond before beginning to decrease. These findings are confirmed in Panel C in Table 3.10., for the sub-sample of syndicates in which there is a top 7 reputable underwriter. Although large syndicates are formed by several underwriters, they are not heterogeneously reputable. Taking together low underwriters' 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 who decide to join a large syndicate. In this sense, assuming that, as the industry argues, in large syndicates some banks do not execute any effort, which consequently risks a deal's success and puts underwriters' reputations at stake, these findings would confirm that more reputable banks are less likely to accept becoming part of a large syndicate.

Table 3.11. shows the estimation results for the probit models on the syndicate decision. As in Table 3.9., supporting the size hypothesis, we find that bonds with large proceeds and domestic bonds are more likely to be placed by a syndicate of underwriters. Moreover, as expected, *UW relative bond weight* has a negative coefficient which means that as a bond increases its relevance for the underwriter, it is less likely to accept a joint-deal. Further, the regressions show that *relative pipeline* is positive, meaning that the busier an underwriter is, considering its reputation and market conditions, the more likely it is to accept a syndicated deal. It is worth mentioning the negative significant coefficient of *UW Reputational distance* and *DistanceMS*. The interaction terms reveal that the likelihood even decreases when the underwriter is one of the most reputable. Taken together, these results suggest that more reputable banks are less likely to be members of a syndicated bond. 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 the underwriting syndication. Nevertheless, they are not likely to join a syndicate if they perceive that they are matching with largely less reputable underwriters. We argue that their reputational concern is what might lead them to refrain from joining these deals.

3.5.4. Does syndication come at cost?

Table 3.13. presents the regressions results of the bond spread before and during the crisis. This table shows the second stage regression results in which, in the first step, 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 insignificant coefficient of the Inverse-Mills ratio that accounts for a non-random syndicate 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 there being 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 a syndicate self-selection process.

3.6. Conclusions

The size of underwriting syndicates has risen sharply since 2000 but particularly 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 industry and investors. From the point of view of the industry the

nature of the underwriting industry is changing, firms hold less exclusive relationships and the market concentration is being reduced. Furthermore, investors are interested in the phenomenon because the large syndication phenomenon might affect the pricing and post-bond performance.

In this paper, we have analyzed the syndicate formation, examining the effects of prior relationships on syndicate 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 more intense effect during the crisis, the bank having the closest lending relationship with the bond issuer increased the probability of being chosen by 11 points (124%) during the crisis compared to the pre-crisis period. Regarding the 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 have a negative effect on bond spread. These results are found to be robust over alternative models and identification.

Overall, these results confirm that the syndication formation has been 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 effects 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 a reputational concern.

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Table 3.1.
Database construction 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	Mean	Median		**Issuer**	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)	Issuer	437
Nº Co-Managers	1.17	0	(1887)	Issuer Parents	345
Nº Managers	4.89	4	(1887)	Underwriters	90
Reputation Top 3	0.08	0	(1887)	Nationality	20
Reputation Top 5	0.23	0	(1887)	Deals	1505
Reputation Top 7	0.36	0	(1887)	Tranches	1887

Table 3.2.
Frequency distribution of sample by year and number of underwriters

The sample consists of bonds issued by non-financial European firms during 2003–2013, collected from Dealogic Capital Markets excluding bonds issued by utilities and regulated firms (SIC: 4000s) and financial firms (SIC: 6000s). This table reports the yearly distribution of bonds by number of underwriters. The average and median numbers of underwriters are also reported yearly.

		Number of Underwriters									
Year	**% sole UW deals**	**1 UW**	**2 UW**	**3 UW**	**4 UW**	**5 UW**	**6 UW**	**>6 UW**	**Mean**	**Median**	**Total**
2003	23.53%	28	36	33	11	11	0	0	2.50	2	119
2004	16.85%	15	38	21	13	0	2	0	2.45	2	89
2005	27.94%	19	20	20	8	1	0	0	2.29	2	68
2006	12.87%	13	23	38	21	6	0	0	2.84	3	101
2007	14.29%	16	40	31	15	9	1	0	2.68	2.5	112
2008	16.94%	21	47	30	20	6	0	0	2.54	2	124
2009	6.44%	15	50	55	75	23	11	4	2.39	3	233
2010	12.92%	27	58	28	36	27	20	13	3.62	3	209
2011	5.24%	10	55	34	40	26	11	15	3.68	3	191
2012	11.01%	38	80	54	81	31	35	26	3.68	4	345
2013	9.46%	28	66	38	64	44	26	30	3.91	4	296
Total	12.19%	230	513	382	384	184	106	88	3.31	3	1887

Table 3.3.
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 3.4.
Determinants of multiple underwritten 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. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. Bond Rating and Issuer Rating are numerical ratings given by S&P to the bond and the issuer at the launch (AAA = 22, Aaa = 21, . . ., CCC+ or below =1). Domestic placement is a dummy taking the value 1 for domestic placed bonds. The variable firm size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issue. Finance vehicle is a dummy taking the value 1 if the issuer is a finance vehicle company. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. Nº co-managers are the number of co-managers in the syndicate. UW Syndicate Reputation is the average market share of the syndicate underwriters. Market Simultaneity is a 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. UW previous co-manager is a 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 is a dummy taking the value 1 if the underwriter(s) has underwritten a bond for the issuer un the last 2 years since the date of issuance. UW previous lender is a 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 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. Industries dummies are based on SIC classification. Crisis is a dummy that takes the value 1 for issues made from September 2008 to December 2013. 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) Probit- Bond Rating	(2) Probit- Issuer Rating	(3) Probit – Strength Rel. - Bond Rating	(4) Probit - Strength Rel. - Issuer Rating
Issue size	0.950***	1.027***	0.942***	1.002***
	(0.0958)	(0.100)	(0.102)	(0.109)
Maturity	-0.0823	0.0378	-0.165	-0.0541
	(0.168)	(0.173)	(0.149)	(0.155)
Callability	-0.206	0.226	-0.173	0.251
	(0.211)	(0.237)	(0.218)	(0.241)
Bond Rating	-0.0454	-	-0.0360	-
	(0.0422)		(0.0397)	
Issuer Rating	-	-0.00939	-	0.0151
		(0.0547)		(0.0515)
Domestic Placement	-0.851**	-0.984***	-0.825**	-1.016***
	(0.375)	(0.327)	(0.367)	(0.324)
Issuer Size	-0.0536	-0.0182	-0.0529	-0.0375
	(0.0785)	(0.111)	(0.0760)	(0.109)
Leverage	-0.00307*	-0.00406	-0.00270	-0.00344
	(0.00168)	(0.00305)	(0.00166)	(0.00287)
ROA	0.0633***	0.0645**	0.0554***	0.0486*
	(0.0189)	(0.0258)	(0.0205)	(0.0269)
Finance Vehicle	-0.189	-0.159	-0.217	-0.178
	(0.193)	(0.226)	(0.201)	(0.227)
First time-issuer	0.291	0.0335	0.287	0.112
	(0.229)	(0.259)	(0.222)	(0.264)
Nº Co-Managers	-0.0642***	-0.0783***	-0.0641***	-0.0787***
	(0.0206)	(0.0157)	(0.0193)	(0.0157)
UW Syndicate Reputation	-0.0261	-0.0331	-0.00891	-0.0235
	(0.0283)	(0.0320)	(0.0281)	(0.0321)
Market Simultaneity	0.170***	0.224***	0.131***	0.187**
	(0.0447)	(0.0750)	(0.0421)	(0.0745)
UW previous co-manager	0.374**	0.419**	0.342*	0.339
	(0.162)	(0.199)	(0.181)	(0.206)
UW previous bond UW	0.431***	0.399**	0.421***	0.408**
	(0.160)	(0.157)	(0.163)	(0.161)
UW previous lender	0.683***	0.821***	0.714***	0.836***
	(0.205)	(0.240)	(0.196)	(0.217)
Relational HHI			-1.332***	-1.295***
			(0.375)	(0.410)
Relational HHI*Crisis			3.037***	3.412***
			(0.802)	(1.087)
Observations	1,629	1,412	1,629	1,412
Year	Yes	Yes	Crisis Dummy	Crisis Dummy
Industries	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered
Pseudo R2	0.4557	0.5175	0.4644	0.5215
Log-Likelihood	-303.57918	-230.67968	-298.75259	-228.73132
p-value (chi2)	0.00	0.00	0.00	0.00

Table 3.5.
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. Marginal Effects of column Columns 5 and 6 are computed from estimates of Column 3 and 4. In Column (5) and (6) the values represent the effect on probability when the relationship measures goes from zero to one. Coefficients and standard errors are multiplied by 100. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Domestic placement is a dummy taking the value 1 for domestic placed bonds. Issuer size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issuance. Finance vehicle is a dummy taking the value 1 if the issuer is a finance vehicle company. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. Underwriter reputation, the market share of the underwriter computed on a apportioned proceeds basis. UW Industry specialization is the industry Herfindhal index for each underwriter based on 2 digits SIC-industry codes. Shared nationality is a dummy taking the value 1 if the underwriter and the issuer are located in the same country. All relationships variables are defined in the text based on a two-year window. 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)

	Coefficients 2003 - 2013				Marginal Effects (x100)	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Issue size	0.162***	0.157***	0.158***	0.164***		
	(0.0101)	(0.0105)	(0.0115)	(0.0102)		
Maturity	-0.0132	-0.0130	-0.0160	-0.0111		
	(0.0140)	(0.0148)	(0.0173)	(0.0141)		
Callability	0.0325*	0.0198	0.0454**	0.0312*		
	(0.0169)	(0.0178)	(0.0214)	(0.0170)		
Domestic Placement	-0.144***	-0.152***	-0.109***	-0.147***		
	(0.0245)	(0.0267)	(0.0268)	(0.0245)		
Investment Grade	-0.0218	-0.00866	-0.0171	-0.0210		
	(0.0244)	(0.0262)	(0.0290)	(0.0245)		
Issuer size	0.0178**	0.0109	-0.0479***	0.0151**		
	(0.00706)	(0.00779)	(0.00913)	(0.00712)		
Leverage	0.0229	0.0778	0.106*	0.0211		
	(0.0539)	(0.0578)	(0.0623)	(0.0541)		
ROA	-0.00303*	-0.00156	0.00206	-0.00281*		
	(0.00167)	(0.00185)	(0.00204)	(0.00170)		
Finance Vehicle	-0.0213	0.0187	0.0231	-0.0195		
	(0.0180)	(0.0193)	(0.0233)	(0.0182)		
First time issuer	0.0146	0.0638***	0.0739***	0.0191		
	(0.0180)	(0.0202)	(0.0217)	(0.0182)		
UW Reputation	0.138***	0.119***	0.108***	0.136***		
	(0.00329)	(0.00344)	(0.00356)	(0.00331)		
UW Industry specialization	-0.898***	-0.809***	-0.714***	-0.897***		
	(0.0425)	(0.0420)	(0.0427)	(0.0426)		
Shared nationality	0.885***	0.740***	0.709***	0.871***		
	(0.0243)	(0.0251)	(0.0249)	(0.0244)		
UW Mkt. Share		2.186***				
		(0.132)				

Table 3.5. (cont.)

Dep. Var: UW Chosen (0 | 1)						
	Coefficients 2003 - 2013				Marginal Effects (x100)	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
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)		(0.174)	
Max Relationship UW				0.453***		3.72***
				(0.0653)		(0.536)
Max Relationship Lender				0.712***		5.85***
				(0.117)		(0.963)
Observations	114,399	114,399	114,399	114,399		
Year	Yes	Yes	Yes	Yes		
Industries	Yes	Yes	Yes	Yes		
Countries	Yes	Yes	Yes	Yes		
Standard Errors	Clustered	Clustered	Clustered	Clustered		
Pseudo R^2	0.2563	0.2912	0.3057	0.2587		
p-value (chi2)	0.00	0.00	0.00	0.00		

Table 3.6.
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. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Domestic placement is a dummy taking the value 1 for domestic placed bonds. Issuer size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issuance. Finance vehicle is a dummy taking the value 1 if the issuer is a finance vehicle company. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. Underwriter reputation, the market share of the underwriter computed on a apportioned proceeds basis. UW Industry specialization is the industry Herfindhal index for each underwriter based on 2 digits SIC-industry codes. Shared nationality is a dummy taking the value 1 if the underwriter and the issuer are located in the same country. All relationships variables are defined in the text. In Columns 1 -3 the measure relationships on a two-year window while in Column 4 a one-year window is considered. 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)

	Crisis Effects (2yrs)			Crisis Effects (1yrs)
VARIABLES	(1)	(2)	(3)	(4)
Issue size	0.156***	0.158***	0.163***	0.155***
	(0.0106)	(0.0117)	(0.0102)	(0.0106)
Maturity	-0.0142	-0.0147	-0.0109	-0.00893
	(0.0148)	(0.0174)	(0.0141)	(0.0143)
Callability	0.0193	0.0451**	0.0312*	0.0159
	(0.0180)	(0.0215)	(0.0170)	(0.0175)
Domestic Placement	-0.150***	-0.105***	-0.147***	-0.139***
	(0.0272)	(0.0270)	(0.0246)	(0.0264)
Investment Grade	-0.00567	-0.0162	-0.0211	0.00430
	(0.0267)	(0.0292)	(0.0246)	(0.0263)
Issuer size	0.0133*	-0.0476***	0.0153**	0.0114
	(0.00787)	(0.00918)	(0.00712)	(0.00775)
Leverage	0.0829	0.106*	0.0223	0.0878
	(0.0579)	(0.0624)	(0.0541)	(0.0576)
ROA	-0.00198	0.00166	-0.00293*	-0.00206
	(0.00187)	(0.00206)	(0.00168)	(0.00187)
Finance Vehicle	0.0133	0.0194	-0.0208	0.0162
	(0.0194)	(0.0235)	(0.0182)	(0.0191)
First time issuer	0.0668***	0.0739***	0.0190	0.0350*
	(0.0203)	(0.0217)	(0.0182)	(0.0195)
UW Reputation	0.119***	0.108***	0.136***	0.125***
	(0.00344)	(0.00355)	(0.00331)	(0.00340)
UW Industry specialization	-0.805***	-0.714***	-0.896***	-0.840***
	(0.0423)	(0.0428)	(0.0426)	(0.0423)
Shared nationality	0.741***	0.711***	0.872***	0.784***
	(0.0251)	(0.0250)	(0.0244)	(0.0248)
UW Mkt. Share	2.154***			1.512***
	(0.132)			(0.137)
Prior UW		0.514***		
		(0.0283)		

Table 3.6. (cont.)

	Dep. Var: UW Chosen (0 | 1)			
	Crisis Effects (2yrs)			Crisis Effects (1yrs)
VARIABLES	(1)	(2)	(3)	(4)
Max Relationship UW			0.454***	
			(0.0653)	
Lender Mkt.Share	2.452***			3.255***
	(0.335)			(0.419)
Lender Mkt.Share*Crisis	2.256***			1.933***
	(0.492)			(0.616)
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)	
Observations	114,399	114,399	114,399	114,399
Year	Crisis Dummy	Crisis Dummy	Crisis Dummy	Crisis Dummy
Industries	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered
Pseudo R^2	0.2929	0.3059	0.2589	0.2829
p-value (chi2)	0.00	0.00	0.00	0.00

Table 3.7.
Predicted average probabilities of effects of lending relationships

This table presents the average adjusted probabilities on the underwriter choice based on regression on Table 3.10.

	With prior relationships		Without prior relationships	
	Prior Lender (1 → 1)	**Max Relationship Lender (1 → 1)**	**Prior Lender (0→1)**	**Max Relationship Lender (0→1)**
Precrisis	Prob (UW chosen =1) = 0.103308	Prob (UW chosen =1) = 0.088409	Prob (UW chosen =1) = 0.0433335	Prob (UW chosen =1) = 0.0572726
Crisis	Prob (UW chosen =1) = 0.1083799	Prob (UW chosen =1) = 0.1986973	Prob (UW chosen =1) = 0.1083799	Prob (UW chosen =1) = 0.1986973
ΔProb (UW chosen=1)	0.0050719	0.1102881	0.0650449	0.1414247
Δ%	4.91%	124.72%	150.09%	246.93%

Table 3.8.
Effects of lending relationships on the underwriter choice during the financial crisis

This table presents the coefficients for the Probit regressions for the determinants of being chosen as underwriter in a given deal. The dependent variable is a dummy taking the value 1 if the bank is chosen. The choice set includes all banks that have underwritten more than 1% of the deals in the year of the bond issuance. All relationships variables are defined in the text. In Columns 1 -3 the measure relationships on a two-year window. 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

	Excluding <1% mkt.share deals			**Crisis =1**	
				Recent Borrowers=1	**Recent Borrowers=0**
VARIABLES	(1)	(2)	(3)	(4)	(5)
UW Mkt.Share	2.098***			1.994***	2.153***
	(0.132)			(0.210)	(0.298)
Prior UW		0.492***			
		(0.0283)			
Max Relationship UW			0.438***		
			(0.0646)		
Lender Mkt.Share	2.540***			3.743***	5.289***
	(0.337)			(0.522)	(0.582)
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	59,302	28,808
Year	Crisis Dummy	Crisis Dummy	Crisis Dummy	-	-
Industries	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered	Clustered
Pseudo R^2	0.2288	0.2413	0.1904	0.2749	0.3710
p-value (chi2)	0.00	0.00	0.00	0.00	0.00

Table 3.9.
Determinants of the number of underwriters

This table presents the coefficients and the z-statistics for the Zero-Truncated Poisson and Ordered Probit regressions on the number of bond underwriters. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. Bond Rating and Issuer Rating are numerical ratings given by S&P to the bond and the issuer at the launch (AAA = 22, Aaa = 21, . . ., CCC+ or below =1). Domestic placement is a dummy taking the value 1 for domestic placed bonds. The variable firm size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issue. Finance vehicle is a dummy taking the value 1 if the issuer is a finance vehicle company. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. Nº co-managers are the number of co-managers in the syndicate. UW Syndicate Reputation is the average market share of the syndicate underwriters. Market Simultaneity is a 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. UW previous co-manager is a 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 is a dummy taking the value 1 if the underwriter(s) has underwritten a bond for the issuer un the last 2 years since the date of issuance. UW previous lender is a 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. 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)	
VARIABLES	ZTP Bond Rating	ZTP Issuer Rating	OProbit I Bond Rating	OProbitII Issuer Rating
Issue Size	0.412***	0.408***	0.903***	0.938***
	(0.0358)	(0.0412)	(0.0608)	(0.0673)
Maturity	0.00941	0.0493	0.0859	0.155*
	(0.0362)	(0.0370)	(0.0855)	(0.0900)
Callablility	0.0274	0.0427	-0.0262	0.0420
	(0.0433)	(0.0446)	(0.114)	(0.121)
Bond Rating	-0.0330***		-0.0720***	
	(0.0112)		(0.0269)	
Issuer Rating		-0.0335**		-0.0672*
		(0.0135)		(0.0358)
Domestic Placement	-0.596***	-0.535***	-1.178***	-1.391***
	(0.142)	(0.143)	(0.292)	(0.260)
Issuer size	-0.00221	-0.0127	0.0151	0.00848
	(0.0270)	(0.0316)	(0.0579)	(0.0764)
Leverage	-0.000821	-0.00127	-0.00170	-0.00223
	(0.000663)	(0.000888)	(0.00143)	(0.00207)
ROA	-0.000115	-0.00290	0.0134	0.00501
	(0.00473)	(0.00570)	(0.0123)	(0.0154)
Finance Vehicle	-0.0601	-0.0233	-0.169	-0.136
	(0.0514)	(0.0585)	(0.114)	(0.133)
First time issuer	0.0386	-0.00913	0.161	-0.0288
	(0.0525)	(0.0684)	(0.134)	(0.172)
Nº Co-Managers	-0.00941	-0.00879	-0.0241	-0.0256
	(0.00945)	(0.0101)	(0.0196)	(0.0204)
UW Syndicate Reputation	-0.0313***	-0.0313***	-0.0497**	-0.0571**
	(0.0104)	(0.0103)	(0.0238)	(0.0250)
Market Simultaneity	0.0301	0.0316	0.0458	0.0521
	(0.0218)	(0.0231)	(0.0524)	(0.0593)
UW previous co-manager	0.0953***	0.103***	0.172*	0.170*
	(0.0369)	(0.0377)	(0.0929)	(0.0992)

Table 3.9. (cont.)

	Dep. Var: Number of Underwriters		**Dep. Var:** Size (1- 4)	
VARIABLES	ZTP Bond Rating	ZTP Issuer Rating	OProbit I Bond Rating	OProbitII Issuer Rating
UW previous UW	0.0908**	0.0823*	0.289***	0.295**
	(0.0405)	(0.0431)	(0.102)	(0.115)
UW previous lender	0.0867**	0.0577	0.281***	0.308***
	(0.0375)	(0.0406)	(0.0905)	(0.0986)
Constant cut1			2.323***	2.542***
			(0.717)	(0.852)
Constant cut2			4.614***	4.899***
			(0.726)	(0.861)
Constant cut3			6.124***	6.470***
			(0.746)	(0.884)
Observations	1,629	1,412	1,629	1,412
Pseudo R^2 / R-squared	0.1493	0.1426	0.2804	0.2924
Year	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered

Table 3.10.
Univariate statistics by syndicate size

PANEL A. Descriptive statistics

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. Bond Rating and Issuer Rating are numerical ratings given by S&P to the bond and the issuer at the launch (AAA = 22, Aaa = 21, . . . , CCC+ or below =1)

		Small Syndicate	Medium Syndicate	Large Syndicate	Small vs Medium	Medium vs Large	Small vs Large
UW reputation	Mean	5.0284	5.1889	4.4677	-1.45	6.90***	4.68**
	Median	5.0366	5.0193	4.4302			
Bond Rating	Mean	15.95	15.27	13.71	3.87**	6.52***	9.23***
	Median	16	16	14			
Issuer Rating	Mean	15.96	15.33	13.77	3.75**	6.54***	9.12***
	Median	16	16	14			

PANEL B. Syndicate features

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			
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			

PANEL C. Sub-sample best reputable underwriters (Top 7)

	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	6.61	2.87	9.12	5.73	2.72	8.05	4.81	2.37	6.18			
Std. Dev. Syndicate Reputation	2.70	0.10	4.94	2.62	0.53	3.98	2.29	0.92	3.22			
Syndicate Ratio UW rep/Less rep	5.31	1.01	10.53	8.34	1.21	12.46	25.17	1.45	35.04			
Syndicate Ratio UW rep/Synd rep	1.39	1.00	1.83	1.56	1.09	1.97	1.68	1.16	2.14			

Table 3.11.
Determinants of the number of underwriters: Second-stage results

This table presents the coefficients and the z-statistics for the Second-stage baseline OLS results for the number of bond underwriters. 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. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. Bond Rating and Issuer Rating are numerical ratings given by S&P to the bond and the issuer at the launch (AAA = 22 , Aaa = 21 ,. . . , CCC+ or below =1). Domestic placement is a dummy taking the value 1 for domestic placed bonds. The variable firm size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issue. Finance vehicle is a dummy taking the value 1 if the issuer is a finance vehicle company. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. Nº co-managers are the number of co-managers in the syndicate. UW Syndicate Reputation is the average market share of the syndicate underwriters. Market Simultaneity is a 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. UW previous co-manager is a dummy taking the value 1 if the issuer has appointed the underwriter(s) as co-manager in a previous bond issuance. UW previous UW is a dummy taking the value 1 if the underwriter(s) has underwritten a bond for the issuer un the last 3 years since the date of issuance. UW previous lender is a dummy taking the value 1 if the underwriter(s) has underwritten a loan in a syndicate-loan for the issuer in the last 3 years since the date of issuance. Industries dummies are based on SIC classification. The inverse Mills-ratio is obtained from first-stage probit estimations to control for self-selection bias. 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: Nº of UWs for multiple UW deals	
VARIABLES	OLS Bond Rating	OLS Issuer Rating
Issue Size	1.072***	0.941***
	(0.138)	(0.141)
Maturity	0.00572	0.116
	(0.112)	(0.109)
Callablility	0.0512	0.0615
	(0.147)	(0.151)
Bond Rating	-0.0916**	
	(0.0376)	
Issuer Rating		-0.123**
		(0.0489)
Domestic Placement	-1.219***	-1.185***
	(0.254)	(0.275)
Issuer size	0.0336	0.0394
	(0.0828)	(0.105)
Leverage	-0.00298	-0.00504
	(0.00218)	(0.00309)
ROA	-0.0166	-0.0232
	(0.0158)	(0.0180)
Finance Vehicle	-0.126	-0.00145
	(0.165)	(0.176)
First time issuer	0.166	-0.103
	(0.177)	(0.187)
UW Syndicate Reputation	-0.110***	-0.101***
	(0.0307)	(0.0292)
UW previous co-manager	0.263*	0.295**
	(0.146)	(0.143)
UW previous UW	0.358**	0.245*
	(0.145)	(0.134)
UW previous lender	0.301**	0.138
	(0.139)	(0.147)
Inverse Mills Ratio	1.065***	0.546*
	(0.339)	(0.314)
Observations	1,453	1,262
R-squared	0.366	0.357
Year	Yes	Yes
Industries	Yes	Yes
Countries	Yes	Yes
Standard Errors	Clustered	Clustered

Table 3.12.
Determinants of multiple underwritten deals

This table presents the coefficients and the z-statistics for the Probit regressions for the determinants of multiple underwritten deals. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. The investment grade variable is a dummy taking the value 1 for Investment Grade bonds. Domestic placement is a dummy taking the value 1 for domestic placed bonds. Issuer size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issuance. Finance vehicle is a dummy taking the value 1 if the issuer is a finance vehicle company. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. Nº co-managers are the number of co-managers in the syndicate. UW Rel. bond weight, UW Reputational Distance, Distance MS and Relative Pipelane are described in the text. TOP 5 Rep UW is a dummy taking the value 1 if the UW's market share is equal or higher than the market share held by the fifth underwriter in the annual league table. 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: Multiple Underwritten Deal (0 | 1)					
VARIABLES	I	II	III	IV	VI	VII
Issue Size	0.848***	0.743***	0.883***	0.785***	0.898***	0.723***
	(0.0540)	(0.0558)	(0.0557)	(0.0582)	(0.0566)	(0.0604)
Maturity	-0.0735	-0.0846	-0.0455	-0.0580	-0.0341	-0.0577
	(0.104)	(0.105)	(0.108)	(0.108)	(0.108)	(0.109)
Callablility	0.0429	0.0569	0.0596	0.0721	0.0883	0.122
	(0.137)	(0.139)	(0.143)	(0.144)	(0.143)	(0.147)
Domestic Placement	-0.534***	-0.528***	-0.556***	-0.547***	-0.566***	-0.540***
	(0.184)	(0.182)	(0.183)	(0.181)	(0.183)	(0.180)
Investment Grade	0.257	0.240	0.258	0.243	0.271*	0.261
	(0.162)	(0.162)	(0.159)	(0.159)	(0.158)	(0.160)
Issuer size	0.0364	0.0357	0.0486	0.0471	0.0553	0.0554
	(0.0480)	(0.0479)	(0.0481)	(0.0480)	(0.0482)	(0.0481)
Leverage	0.000171	0.000190	7.20e-05	0.000102	8.29e-05	0.000147
	(0.000541)	(0.000535)	(0.000409)	(0.000409)	(0.000406)	(0.000407)
ROA	0.0196	0.0210*	0.0224*	0.0236*	0.0237**	0.0263**
	(0.0125)	(0.0126)	(0.0121)	(0.0123)	(0.0120)	(0.0123)
Finance Vehicle	-0.252**	-0.247**	-0.257**	-0.251**	-0.254**	-0.240*
	(0.121)	(0.122)	(0.121)	(0.123)	(0.121)	(0.124)
First time issuer	0.148	0.141	0.139	0.135	0.161	0.173
	(0.136)	(0.135)	(0.135)	(0.134)	(0.134)	(0.134)
Nº Co-Managers	-0.0502***	-0.0530***	-0.0510***	-0.0533***	-0.0520***	-0.0532***
	(0.0132)	(0.0138)	(0.0134)	(0.0139)	(0.0134)	(0.0141)
UW Rel. bond weight	-1.119***	-1.166***	-1.205***	-1.234***	-1.273***	-1.313***
	(0.141)	(0.138)	(0.140)	(0.138)	(0.143)	(0.141)
UW Reputational Distance	-0.172***		-0.163***		-0.325***	
	(0.0403)		(0.0413)		(0.0704)	
Distance MS		-0.199***		-0.184***		-0.416***
		(0.0382)		(0.0392)		(0.0658)
Relative Pipelane			0.333***	0.310***	0.313***	0.275***
			(0.0949)	(0.0951)	(0.0902)	(0.0906)
TOP 5 Rep UW * UW Reputational Distance					-0.153***	
					(0.0440)	
TOP 5 Rep UW * Distance MS						-0.192***
						(0.0429)

Table 3.12. (cont.)

	Dep. Var: Multiple Underwritten Deal (0 | 1)					
VARIABLES	I	II	III	IV	VI	VII
Observations	6,122	6,122	6,122	6,122	6,122	6,122
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 R^2	0.4115	0.4155	0.4207	0.4235	0.4242	0.4322
Log- Likelihood	-569.34363	-565.474	-560.42512	-557.67877	-556.97356	-549.24983
p-value (chi2)	0.00	0.00	0.00	0.00	0.00	0.00

Table 3.13.
Bond pricing

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 3.4. Issue size is the natural logarithm of the bond proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. Bond Rating and Issuer Rating are numerical ratings given by S&P to the bond and the issuer at the launch (AAA = 22 , Aaa = 21 , . . . , CCC+ or below =1). The variable firm size is the natural logarithm of the issuer's total assets at the end of the year before the bond issue. Leverage is a ratio of total liabilities and equity. ROA is computed as the return on assets based on the net incomes and total assets at the end of the year before the bond issue. First time-issuer is a variable taking the value 1 if the bond is the first bond issued by the issuer in the last 15 years. UW Reputation (TOP 7) is a dummy taking the value 1 if the average market share of the syndicate underwriters is larger or equal to the top 5th annual underwriter. The inverse Mills-ratio is obtained from first-stage probit estimations to control for syndication choice endogeneity bias. 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 Benchmark (bps)			
	(1)	**(2)**	**(3)**	**(4)**
VARIABLES	**Precrisis**		**Crisis**	
Issue size	-2.075	-2.443	-12.61*	-12.83*
	(11.46)	(11.25)	(6.813)	(6.791)
Maturity	24.93***	25.11***	3.962	4.050
	(6.537)	(6.517)	(11.75)	(11.75)
Callability	68.94***	69.58***	29.02**	28.75**
	(14.70)	(14.98)	(11.37)	(11.31)
Purpose: Debt Repayment	10.99	9.115	-3.862	-4.145
	(21.86)	(22.16)	(11.59)	(11.63)
Bond Rating	-30.98***	-30.95***	-46.45***	-46.47***
	(3.672)	(3.739)	(4.405)	(4.419)
First-time issuer	1.159	1.681	28.09*	28.30*
	(17.61)	(17.74)	(15.90)	(16.00)
Issuer Size	7.686	7.649	-1.885	-1.813
	(6.917)	(7.015)	(7.293)	(7.317)
Leverage	-0.0301	-0.0261	0.329*	0.334*
	(0.166)	(0.165)	(0.198)	(0.195)
ROA	-1.314	-1.274	-3.352**	-3.309**
	(1.529)	(1.536)	(1.408)	(1.406)
UW reputation (TOP 7)	2.458	2.924	14.60	14.57
	(8.891)	(8.963)	(10.80)	(10.82)
Syndicated Bond (0|1)		-11.77		-33.12
		(35.82)		(42.51)
Inverse Mills Ratio	25.09	18.26	-73.29***	-84.04***
	(27.42)	(31.33)	(26.49)	(24.62)
Observations	351	351	844	844
R-squared	0.748	0.749	0.706	0.706
Year	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes
Standard Errors	Clustered	Clustered	Clustered	Clustered

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix A.3

Figure A.3.1.
Evolution of issuer-underwriter relationships

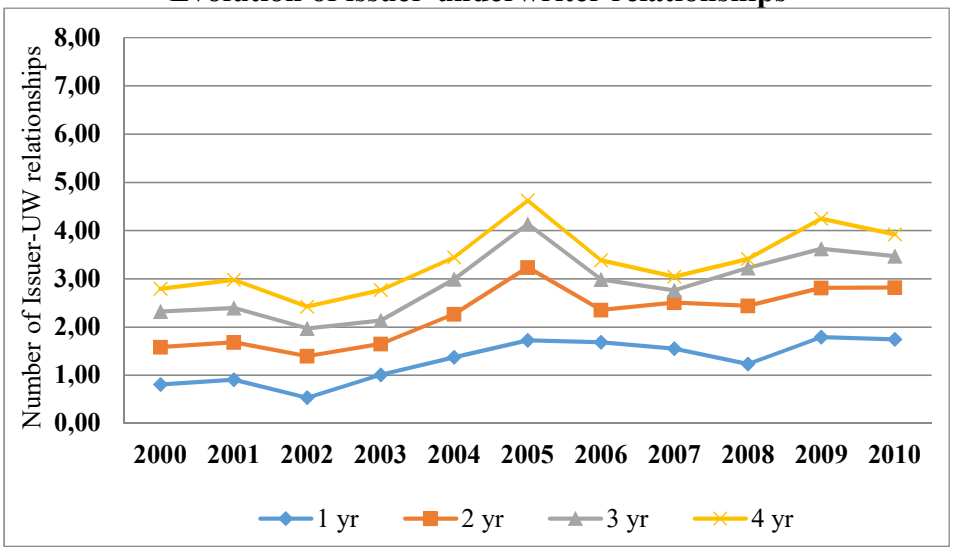


Figure A.3.2
Evolution of the strength of issuer-underwriter relationships

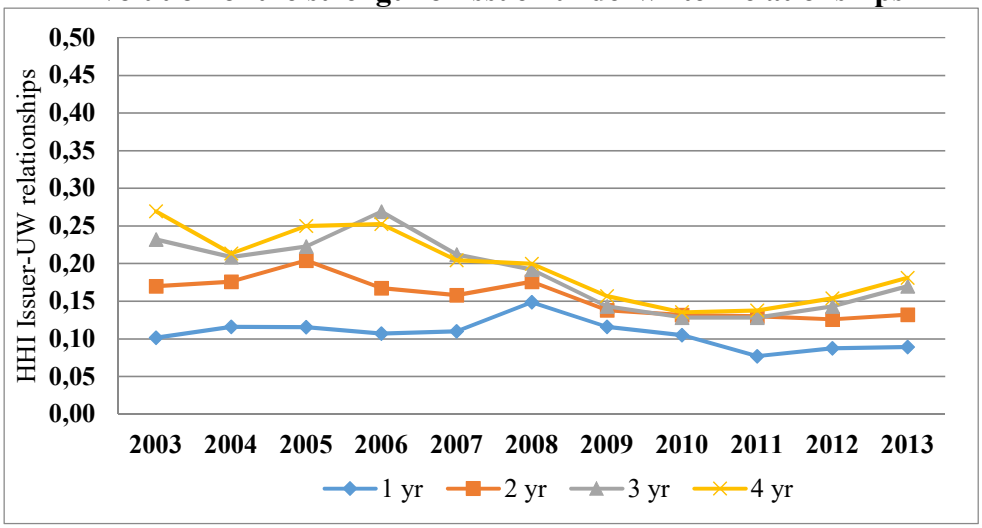
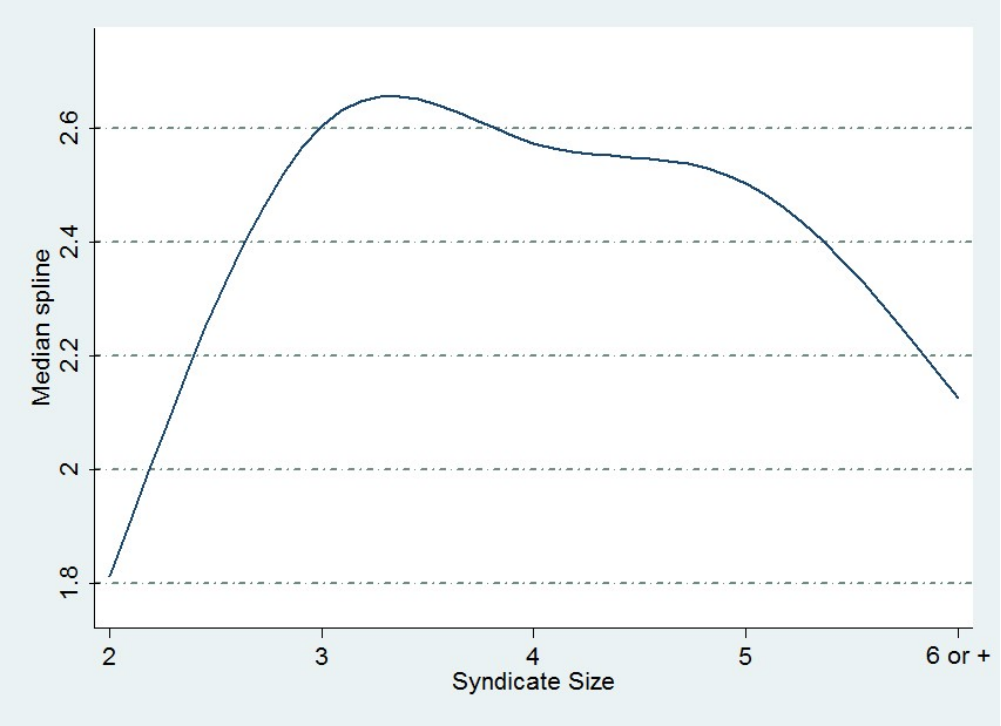


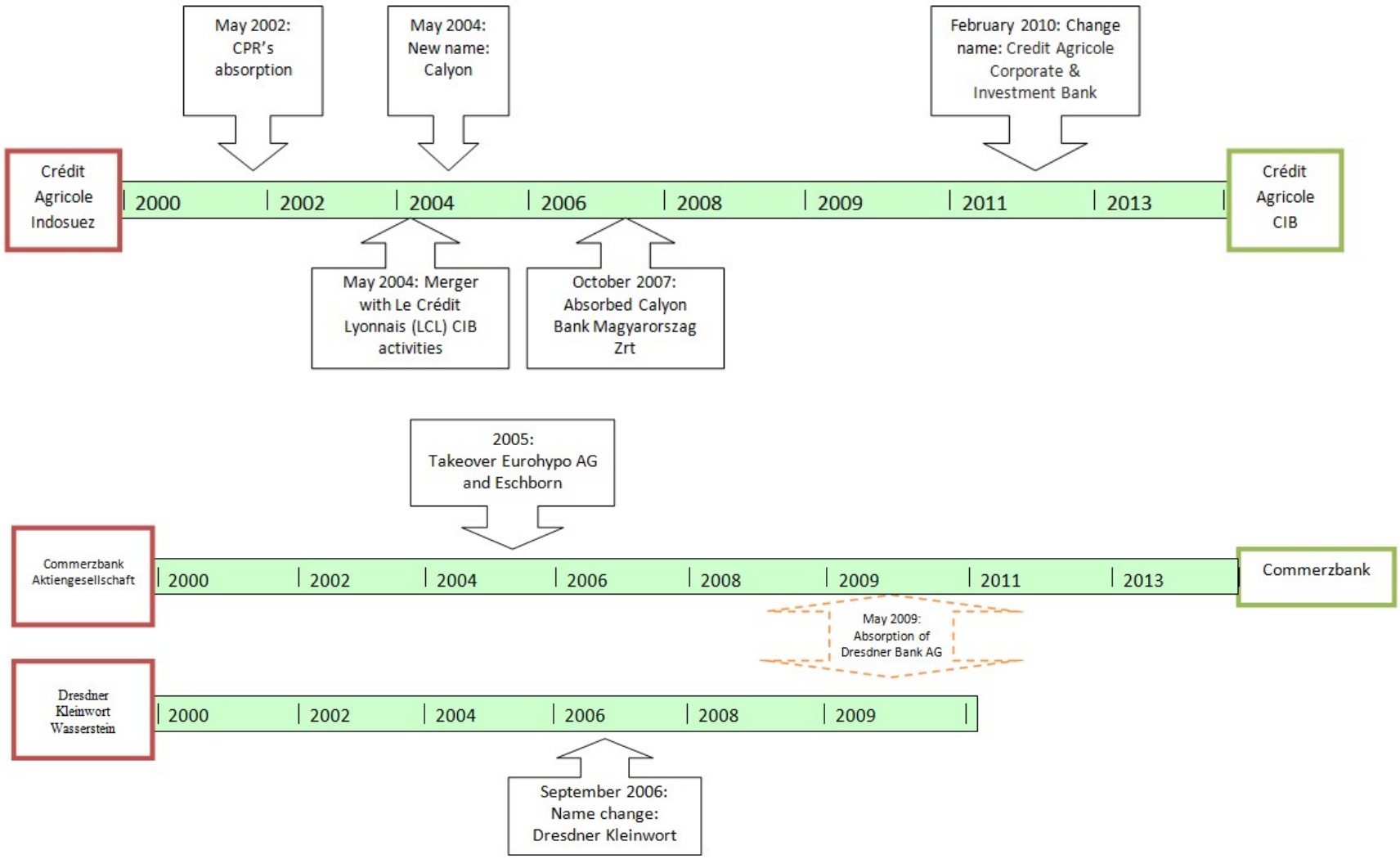
Figure A.3.2.
Syndicate standard deviation

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



Appendix B

Figure B.3.1.
Credit Agricole CIB and Commerzbank lifetimes



CHAPTER 4

Non-pricing drivers of underwriters' reputation in corporate bond markets during the crisis

Abstract:

In this paper, we explore the effects of pricing and non-pricing competitive factors on banks' reputation as underwriters in corporate bond markets. Using a panel of European bond underwriters from 2007–2013, we find that pricing factors are of second-order importance in explaining changes in underwriters' market shares. However, providing joint lending and underwriting services as well as hiring star analysts for the underwriting team significantly increases underwriters' market shares. Additionally, using a difference-in-differences approach, we find that the market share of reputable banks decreases after receiving state recapitalization aid (by 22.6%), while this aid has a positive impact on the market share of non-reputable underwriters (increasing it by 63.6%).

Keywords: Underwriters, reputation, bond, recapitalization

JEL Classification: G24, G21, H81

4.1. Introduction

Underwriting has become a substantial revenue generation activity for many banks[56]. Not surprisingly, many commercial banks have entered the underwriting business at a time when other revenue sources have become less noticeable. Since underwriting requires low capital investment, its strategic importance for banks has grown[57]. In this context, winning underwriting mandates ultimately depends on a set of quantitative and qualitative factors that attracts clients.

A large body of literature argues that reputation can be proxied by the underwriter's market share, and that such reputation acts as a certification signal in debt markets (Beatty & Ritter, 1986; Booth & Smith, 1986; Carter & Manaster, 1990; Chemmanur & Fulghieri, 1994). Additionally, although underwriters seek profitable mandates, the presence of reputational concerns leads reputable banks to compete but mitigating the likelihood of future bad performance that might damage their reputation.

While most prior studies have focused on equity markets, this paper examines the corporate bond market. Corporate bond markets are the largest source of funding for firms; thus, a large number of mandates are agreed in these markets. Moreover, as has been shown in a number of studies (e.g. Andres, Betzer, & Limbach, 2014; Dong, Michel, & Pandes, 2011; Fang, 2005; Griffin, Lowery, & Saretto, 2014; Livingston & Miller, 2000; Narayanan, Rangan, & Rangan, 2007) as well as by anecdotally[58], underwriting has become a considerable revenue source for banks at a time when bond markets have grown substantially.

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[56] According to Dealogic, estimated global debt, equity, and equity-related fees totaled US$ 44 billion during the full year of 2014 and US$ 38.4 billion in 2015.

[57] The industry has underlined the growing weight of "capital light" activities such as underwriting in the financial press. See, e.g. D. Schäfer and T. Alloway's February 21, 2013 *Financial Times* article on "Mid-tiers banks threaten the bulge bracket" and L. Noonan's December 14, 2015 article on "Regulatory changes force investment banks into capital light activities".

[58] Taplin N. and Shen Samuel (15 June 2016) in their newspaper article titled "Debt investors pressure underwriter ICBC in Evergreen bond default" (Reuters) report on how the underwriter's role during the placement was criticized after a bond default.

As loans act as a key relationship device for banks and their corporate clients, relationship lending may have an impact on the success of these banks to attract underwriting mandates of their corporate customers' bonds. While some earlier studies have examined the pricing implications of the joint provision of lending and underwriting services (Kanatas & Qi, 2003; Kang & Liu, 2007; Kim, Palia, & Saunders, 2009; Shivdasani & Song, 2011), we examine the impact of lending relationships on underwriter reputation. As the recent growth of bank bond markets occurred around the crisis, we also explore how banks' reputation as underwriters is affected when they receive state aid for recapitalization. An examination of the effects of state aid recapitalization measures is particularly relevant, as the information disclosed about the beneficiary may affect their subsequent underwriting business. Although this disclosed information may also impact other business areas, we focus on underwriters' market shares because the underwriting business revolves around reputation. Furthermore, while there are a number of different bailout measures (e.g. debt guarantees and asset purchases), we focus on recapitalization, as it is a clearer signal to markets regarding the bank's solvency status and resilience.

Our analysis relies on a sample of 121 underwriters issuing corporate bonds in Europe from 2007–2013. This sample period allows us to explore how market share evolved during the crisis and to examine the impact of state aid for recapitalization. Although the U.S. markets are larger in size than the European markets, the lower concentration in the European underwriting industry suggests that its competitive scenario is more open, with fewer barriers to entry. Therefore, there is more potential for rivalry through reputational signals in these markets. Although a certain degree of fragmentation in European initial public offering (IPO) markets (Vismara, Paleari, & Ritter, 2012) might make market share inappropriate, we provide evidence of a non-fragmented European underwriting industry for corporate bonds. The scarcity of domestic

bonds and the reduced relevance of national local underwriters mitigate the possibility of heterogeneous reputational effects across countries. As has been done in earlier studies (Duarte-Silva, 2010; Esho, Kollo, & Sharpe, 2006; Fernando et al., 2015; Gande, Puri, Saunders, & Walter, 1997; Kim, Palia, & Saunders, 2008; Livingston & Miller, 2000; Lopez & Spiegel, 2014; Megginson & Weiss, 1991; Roten & Mullineaux, 2002; Schenone, 2004), we use market share as proxy for underwriter reputation in Europe.

Our empirical strategy has two dimensions. Firstly, we explore the determinants of underwriter market share using a dynamic panel data model, considering pricing and non-pricing factors. Reputation, as a worthy intangible asset, must be invested in order to issue a credible signal, and its maintenance over time also requires effort. In a competitive scenario, current underwriter reputation, proxied by market share, is likely to be a function of prior reputation. Secondly, as the sample period includes the crisis years during which several bank bailouts occurred, we employ a difference-in-differences (DID) analysis to examine the effects of state aid on underwriter reputation.

We find no evidence that competition in bank bond underwriting market shares in Europe is driven by pricing, contrary to U.S. capital markets. Rather, we find that other qualitative factors such as the reputation of the analysts employed by the underwriter have a significant impact on market share. Moreover, the underwriter's market share is also found to be positively affected by mandates that entail providing joint lending and underwriting services. Additionally, in line with the reputational hypothesis, we find that reputable underwriters suffer losses in their underwriting market shares after being recapitalized (by 22.66% from their median market share). However, non-reputable underwriters increase their market share after being recapitalized (by 63.66% from their median). Our results are found to be robust to different identification and measurement checks.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Hypotheses and research questions are presented in Section 3. Section 4 describes the data and methodology. The empirical results are presented in Section 5. Section 6 concludes.

4.2. Related Literature

4.2.1. The role of reputation in capital markets

Some theoretical contributions have shown that underwriting function of commercial and investment banks is linked to their reputation (Beatty & Ritter, 1986; Booth & Smith, 1986; Carter & Manaster, 1990; Chemmanur & Fulghieri, 1994). Reputation is valuable in reducing the information asymmetries in capital markets. Reputational concerns justify underwriters' avoidance of engaging in opportunistic behaviors that could negatively affect their reputation. These same concerns discourage underwriters' misuse of private information with the aim of improving their short-term performance. Reputable underwriters implement standards to assess issuers' quality in order to prevent future bad performances (Chemmanur and Fulghieri, 1994). A number of studies have found empirical support for the certification hypothesis (Dong, Michel, & Pandes, 2011; Dunbar, 2000; Lily H. Fang, 2005; Livingston & Miller, 2000; Yung & Zender, 2010).

Conversely, other studies argue that in some circumstances reputable underwriters do not always certify the intrinsic value of the issue. Chemmanur & Krishnan, (2012) propose the "market power hypothesis", arguing that reputable underwriters overprice the issue further away for their intrinsic value, attracting high-quality market players. They find that reputable underwriters are associated with higher valuations, since they are able to attract high-quality market participants that increase the heterogeneity in investor

beliefs. Griffin et al., (2014) find that complex securities (e.g. MBS, ABS, and CDO) issued by highly reputable underwriters underperformed during a market downturn. The complexity of the securities issued may weaken the certification hypothesis. In the corporate bonds market, evidence also suggests that bonds underwritten by the most reputable underwriters are associated with significantly higher downgrade and default risk (Andres, Betzer, & Limbach, 2014).

A large body of literature highlights that reputation plays an important role in capital markets. Underwriter reputation explains how firms and underwriters are matched (Drucker & Puri, 2005; Fernando, Gatchev, May, & Megginson, 2015; Fernando, Gatchev, & Spindt, 2005; Hoberg, 2007; A. Ljungqvist, Marston, & Wilhelm, 2006; Yasuda, 2005, 2007), why underwriters are switched in subsequent offerings (Cliff & Denis, 2004; Krigman, Shaw, & Womack, 2001; McKenzie & Takaoka, 2013), and why issuers prefer engaging with reputable underwriters (Burch, Nanda, & Warther, 2005; R. B. Carter, Dark, & Singh, 1998; Fang, 2005; Fernando et al., 2015; Fernando, May, & Megginson, 2012; McCahery & Schwienbacher, 2010; Neupane & Thapa, 2013).

4.2.2. Measuring underwriter reputation

Underwriter reputation in capital markets means producing credible information on third parties with the aim of solving informational asymmetries.[59] Reputation has been measured in various ways. A high level of concentration in the underwriting industry has led to the popularization of the term "bulge bracket underwriters" as a means of revealing the oligopolistic market structure of this industry (Cao, Chen, & Wang, 2014; H. Chen & Ritter, 2000; L.H. Fang, 2005; Kovner, 2012; Yasuda, 2005).

[59] Reputation has been studied from a managerial perspective in the corporate reputation literature, which is focused on several dimensions, such as management quality, innovativeness, responsibility to the community, and the environment or quality of products. Barnett, Jermier, & Lafferty, (2006) provide a review of the relevant literature, identifying three main clusters of meanings: awareness, assessment, and asset.

Measuring underwriter reputation received much attention in the literature in the early 1990s. In a seminal paper, Carter & Manaster (1990) argued that reputation can be inferred by comparing underwriters' positions in tombstone announcements. Underwriters are ranked using numerical values from 0 to 9, based on the position occupied by the underwriter's name on these listings of pending public security offerings. Johnson & Miller (1988) adjusted the Carter-Manaster measure by dividing underwriters into four groups assigning a value from 0 to 3 to all the underwriters on each category. This measure, updated and used in subsequent studies, assumes that underwriters' names are strategically placed strategically wherewith reputable underwriters placed at the top (Burch, Nanda, & Warther, 2005; Carter et al., 1998; Kirkulak & Davis, 2005; Logue, Rogalski, Seward, & Johnson, 2002; Loughran & Ritter, 2002; Suzuki, 2010). Other qualitative studies have used surveys to provide insight into underwriter reputation. Brau & Fawcett (2006) surveyed chief financial officers, and concluded that the underwriter selection process is driven by underwriter reputation, where reputation is inferred from the quality of the research department and their analysts, as well as the underwriter's industry expertise. Roden & Bassler (1996) compared the Caster-Manaster measure with a panel of 10 experts' opinions, and claimed that the experts' qualitative analysis is not better than the quantitative Caster-Manaster measure. Moreover, Dunbar (2000) argued that the variability in the underwriting industry advises against using static measures of reputation such as tombstone announcements for long periods of time.

Notwithstanding the abovementioned measures, market share[60] has been widely accepted in the literature as an accurate proxy for reputation, and is used as such in a large number of empirical papers. This is done primarily because third parties' perceptions of

[60] Market share was first used to measure reputation in a seminal paper of Megginson & Weiss, (1991), leading to the so-called "MW measure". Megginson & Weiss highlight the consistency of their measure, as it was found to be strongly positively correlated to the Caster-Manaster measure.

reputation attract business, and because this measure allows reputation to be considered as time-variant. More reputable underwriters attract more underwriting contracts, which consequently leads to their holding greater market shares[61]. Thus, as being a reputable underwriter serves to capture market share, reputation is not market-share invariant.

Although many papers have built reputation measures based on market share, there are differences among them. Some have used market share as a continuous variable (Duarte-Silva, 2010; Esho, Kollo, & Sharpe, 2006; Fernando et al., 2015; Gande, Puri, Saunders, & Walter, 1997; Kim, Palia, & Saunders, 2008; Livingston & Miller, 2000; Lopez & Spiegel, 2014; Megginson & Weiss, 1991; Roten & Mullineaux, 2002; Schenone, 2004), whilst others have chosen an ordinal measure in which underwriters are clustered into groups according to their market share. Fang, (2005) has justified using an ordinal measure, arguing that market structure is best captured using this method because underwriters are commonly seen as either heavyweight-players or not. For this reason, a number of papers have used an ordinal measure (Andres et al., 2014; Livingston & Miller, 2000; McCahery & Schwienbacher, 2010; Narayanan, Rangan, & Rangan, 2004; Ross, 2010; Vismara, Signori, & Paleari, 2015). The argument that there is a positive relationship between market share and reputation is further supported by the prominence in the financial markets that results from being top-ranked in the League Tables computed by market share. Reputable underwriters are prominent market participants in the bond market which is consistent with a positive relation between market share and reputation (Dunbar, 2000). Furthermore, the consistency of measuring reputation with the market share in financial markets is supported by the use of this measure in the syndication loan market for lead arrangers (Sufi, 2007) and for advisors in mergers and acquisitions (Rau, 2000).

[61] Beatty & Ritter, (1986) relate reputation and market share, arguing that underwriters placing deals with initial returns inconsistent with their ex ante uncertainty lose subsequent market share.

4.3. Explaining the market share in debt underwriting

While a number of studies have explored the role of reputation using market share as proxy, evidence that shows which factors determine underwriters' market shares is still lacking. Therefore, examining market share determinants allow us to open the black box of reputation in debt markets.

Previous studies have argued that in a competitive framework, quantitative and qualitative factors attract clients; and thus market shares are likely to be explained by these factors. The effects of several quantitative and qualitative determinants on market share changes in the US are examined in Dunbar's (2000) seminal paper. Furthermore, Liu & Ritter, (2011) present empirical evidence in support of their theoretical predictions of issuers' willingness to receive pricing and non-pricing underwriting services. In the most specific study on debt issues, Ang & Zhang, (2004) provide evidence of pricing and non-pricing competition among underwriters, while in the equity markets Fernando et al., (2015) find differences on prices and services provided by underwriter reputation. More recently, Chen, Shi, & Xu, (2014) and Huyghebaert & Xu, (2015) show that non-pricing factors – quality of the services provided and public ownership – influence market shares in China, while Migliorati & Vismara, (2014) analyze underwriting rankings in the main European stock markets.

In the underwriting reputational framework, the effects of state aid recapitalization measures on underwriters' market shares are also worth examining. The recent growth of bank bond markets around the time of the crisis allows us to explore banks' reputation in these markets for recipients of state aid recapitalization measures. Reputation may be damaged due to the negative information disclosed about the beneficiary's solvency status and resilience; thus, we examine whether there is an impact on their subsequent underwriting business.

4.3.1. Pricing factors

Although a pricing strategy could be employed by either a newcomer or a well-established underwriter, such a strategy seems more likely to be undertaken by a challenger or less-established underwriter seeking to attract the most price-sensitive part of the market. Under certification-reputational reasoning, reputable underwriters would be less likely to employ a pricing strategy if in doing so they were to attract poor quality firms which might negatively affect negatively their reputation if default occurs latter. In this regard, Fang, (2005) finds that reputable underwriters charge higher fees because they provide high-quality intermediation services. Furthermore, Fernando et al., (2015) show that reputable banks are paid higher fees as a reputational premia. Both studies therefore argue that the higher fees paid are compensation for the superior quality of the services provided.

In addition, according to earlier studies, strategic pricing seems to differ across markets. Torstila, (2003) finds evidence for strategic pricing in the US but not in Europe. Abrahamson, Jenkinson, & Jones, (2011) and Ljungqvist & Jenkinson, (2003) show that the fees charged in Europe are lower than in the US. In the Japanese bond market, Lopez & Spiegel, (2014) demonstrate that underwriters priced their services aggressively from 1996–2011, which they interpreted as an effort to retain or gain market share. In European capital markets, some reports have revealed that fees decreased during the financial crisis. More intense competition coupled with a downturn in the volume of trades would likely explain this lowering of fees[62]. Using our sample of European bonds, Figure 4.1. shows that fees have declined during our sample period, thus confirming prior reports. In 2007, the average fee was around 0.7%, while in 2013 it was around 0.36%. However, it could not be argued that this recent trend reflects strategic pricing in Europe if all underwriters

[62] Wilson, H. (08 January 2011). Banking fees hit decade low as downturn bites http://www.telegraph.co.uk/finance/

lowered their fees. Thus, a general fee cut would not imply the existence of strategic pricing in Europe.

4.3.2. Non-pricing factors

In a certification-reputational framework, where underwriters are able to reduce information asymmetries (Booth and Smith, 1986; Chemmanur and Fulghieri, 1994), highly reputable underwriters are more efficient certifiers because they provide high-quality intermediation services (Fang, 2005; Fernando et al., 2015). Therefore, these high-quality services might help underwriters attract potential clients. For this reason, we examine whether non-pricing factors related to a superior underwriting quality are associated with large market shares.

Among these non-pricing factors, prior literature has found evidence on underwriters' industry specialization and bond valuation. An underwriter's experience in a specific issuer's industry is likely to affect the quality of the services provided (Benveniste, Ljungqvist, Wilhelm, & Yu, 2003; Booth & Chua, 1996) and consequently their market share (Asker & Ljungqvist, 2010; C. Chen et al., 2014; Dunbar, 2000). Nanda & Yun, (1997) find evidence of a relationship between mispricing and reputation. However, as Dunbar (2000) discusses, the relationship between pricing and market share could go both ways, because underwriters might use their pricing abilities either to attract clients or to reward their base of investors. Hence, abnormal spreads could be set to satisfy the bond issuer (setting abnormally low spreads) or to satisfy investors (setting abnormally high spreads).

In addition to these non-pricing factors, the research phase's crucial importance in ensuring success in the placement, coupled with the entry of banks with lending arms into the underwriting business, are worth examining. Consequently, we explore how

providing high-quality analysts and joint lending and underwriting services may impact banks' success in attracting mandates.

4.3.2.1. The role of star analysts

The success of an issuance depends largely on the research phase, which occurs shortly after the mandate. Hence, the role of investment analysts is valuable for issuers, since analysts increase firms' visibility among potential investors, reduce information asymmetries, and enhance liquidity (Autore, Kovacs, & Sharma, 2009; Barth, Zasznik, & McNichols, 2001; Jiraporn, Chintrakarn, & Kim, 2012).

The accuracy of their forecasts allows analysts and their research teams to build a reputation within the industry. Prior literature has found a positive relationship between analyst reputation and research quality[63]. Fang and Yasuda, (2014) have found that star analysts' recommendations outperform those of non-star analysts due to differences in their skills. Similarly, Fang and Yasuda, (2009) have shown that star analysts and analysts working at reputable banks make significantly more accurate and less biased earnings forecasts. Being recognized as a star analyst working for an underwriter entails that the analyst and its research team possess a superior knowledge of the industry. Thus, it serves as a positive signal for potential clients about the quality of the underwriting services. But does the positive relationship between analyst reputation and research quality attract business?

Liu & Ritter, (2011) propose a theoretical model in which an underwriter's market power arises from firms' desire for research coverage by highly influential analysts. Literature on underwriting has found indirect evidence of this by examining how firms match underwriters. Krigman et al., (2001) find that the presence of star analysts reduces the likelihood of switching underwriter, while Corwin & Schultz, (2005) highlight that

[63] See among others (Gleason & Lee, 2003; Jackson, 2005).

having a top-ranked analyst significantly increases the likelihood of an underwriter being chosen. Star analysts seem to be more influential in explaining equity deals' flow, because asymmetries tend to be larger in equity markets. However, there is evidence of analysts' impact on debt markets. Clarke, Khorana, Patel, & Rau, (2007) find that in debt deals, market share increases with the number of star analysts. In a similar vein, Ljungqvist et al., (2006) present evidence of analysts affecting debt. Finally, empirical papers on underwriting market shares show that the presence of star analysts increases underwriters' market shares (Chen et al., 2014; Dunbar, 2000).

Therefore, given the positive relationship between analyst reputation and research quality and the indirect evidence from the underwriting matching literature, we argue that reputable analysts are likely to have a positive influence for the banks for which they work. Therefore, underwriters hiring star analysts for their research team and thus offering high-quality research coverage would be likely to hold larger market shares.

4.3.2.2. Lending relationships and underwriting

The number of commercial banks performing underwriting functions alongside investment banks has increased in Europe since 2007, as Figure 4.2. shows. While in 2007 there were approximately 40 underwriters placing at least one fixed corporate bond in Europe, in 2013 this number rose to 90. Furthermore, according to Figure 4.2. there are more active underwriters in both, the commercial and investment banking. However, Figure 4.3. shows that the increase has been larger on the commercial banking side. In the US, a similar pattern is found. Shivdasani & Song, (2011) report that in the US commercial banks had gained substantial market shares from traditional investment banks by the end of 2008. Consequently, commercial banks presently underwrite more issues for their lenders than they did in the past.

While previous studies have mainly discussed the advantages ("informational advantage") and disadvantages ("conflict of interest") of universal banking[64], this paper focuses on how banks with lending arms might transfer their lending relationship into the underwriting industry, thus fostering their market shares.

In this regard, seminal studies on financial intermediation have referred to banks' ability to assess better borrowers' creditworthiness by handling and processing information (Allen & Faulhaber, 1988; Baron, 1982; Fama, 1985; Grinblatt & Hwang, 1989; Rock, 1986; Welch, 1989). In addition, more recent contributions have proposed that underwriters are better certifiers when there are lending relationships between the issuer and the bank (Duarte-Silva, 2010). Specially, these effects might be stronger between underwriting and lending, as a large body of literature has been devoted to studying the joint production of underwriting and lending functions (Drucker & Puri, 2005; Duarte-Silva, 2010; Hebb & Fraser, 2002; Saunders & Stover, 2004; Schenone, 2004; Suzuki, 2010). Therefore, it seems that an existing lending relationship might allow the bank to provide better underwriting services. In a similar vein, this fact might explain the recent finding that relationships carry over across the investment banking business (Corwin & Stegemoller, 2014). Thus, if providing lending and underwriting services may lead the underwriter to certify better, the question that arises is how the joint provision could affect banks' market shares.

In this sense, prior literature on underwriting matching finds evidence of the positive effects of previous lending relationships between firms and banks when choosing an underwriter in subsequent offerings. Studies based on the issuer-underwriter choice reveal that prior and current credit relationships increase the likelihood of being hired as well as retained in future offerings (Bharath, Dahiya, Saunders, & Srinivasan, 2007;

[64] See among others (Ber, Yafeh, & Yosha, 2001; Calomiris & Pornrojnangkool, 2009; Gande et al., 1997; Kanatas & Qi, 2003; Laux & Walz, 2009).

Corwin & Stegemoller, 2014; Drucker & Puri, 2005; Duarte-Silva, 2010; Ljungqvist, Marston, & Wilhelm, 2006).

Hence, given the fact that banks currently offer lending and underwriting services simultaneously, and that cross-market complementarities seem to allow them to provide quality underwriting services, a priori we would expect that providing joint lending and underwriting services positively affects market shares.

4.3.3. State aid recapitalization

As shown above, reputation is a precious asset for underwriters, because their credibility as certifiers relies on it. This implies a need for preserving reputation, since an external perception of deterioration is believed to have consequences.

All the state aids received by these certifiers during the financial crisis deserve to be examined, since the negative information disclosed – lack of solvency, low operational efficiency, capital shortfalls, funding problems – might erode their reputation. Although a negative signal regarding the resilience of the bank might have consequences in other areas of business, the underwriting business centers around reputation. Reputation is indeed particularly relevant to underwriting, so the effect of reputational concerns on underwriting market shares must be clearer.

A large body of financial literature argues in favor of underwriters' reputational concerns, in which poor performances negatively affect the future volume of business (Booth & Smith, 1986; Carter & Manaster, 1990). In the literature, there is evidence that declining market shares can be attributed to losses in reputational capital. For example, the bonds scandal experienced by Salomon Brothers led the bank to lose market share in the underwriting industry (Smith, 1992). Furthermore, Beatty, Bunsis, & Hand, (1998) show that not only consummated scandals negatively impact on market share: rather, it is enough to be publicly targeted as subject to formal investigation. Similarly and more

recently, Hanley & Hoberg, (2012) find that underwriters with exposure to lawsuits experience market share declines. Given the above, reputational concerns and consequently the effects on reputation might lead a bank to reject a recapitalization offer (Corbett & Mitchell, 2000). Banks are aware of the stigma attached to participating in government programs, as this could mean admitting financial weakness (Philippon & Skreta, 2012).

Furthermore, related literature on banking trust has shown that during a period of financial turmoil, banking trust disappears[65], which might lead to a more severe loss of trust for troubled banks (Sapienza & Zingales, 2012). This discussion is also related to the literature examining the market discipline of banking organizations. A number of papers find evidence of market disciplining effects in subordinated debt and depositors[66]. Hence, in the banking industry third parties seem to penalize financial institutions when they behave inappropriately.

On the one hand, it could be argued that state aid for recapitalization may damage reputation. Regulators implement these state aids after documenting capital shortfalls when banks' survival is at stake. Thus, being a recipient of state aid inevitably discloses a financial weakness. Consequently, the loss of reputation would be the result of the disclosure of negative information. These negative signals regarding banks' resilience are particularly relevant in underwriting, since the importance of reputation is greater in the underwriting industry. Thus, given the certification-reputational theory about underwriters' reputational concerns, recipients of state aid may undergo losses in their underwriting market share.

[65] There are some studies on banks' distrust during the financial crisis. Carbó-Valverde, Maqui-López, & Rodriguez-Fernandez, (2013) examine the Spanish banking system, Mosch & Prast, (2008) the Dutch banking system, and Knell & Stix, (2009) the Austrian banking system.
[66] Berger & Turk-ariss, (2015) offer detailed coverage of the extant literature on market discipline.

On the other hand, recent studies of banks' recapitalization have identified benefits of the adoption of these measures, e.g. the reinforcement of banks' capital base. Berger & Roman, (2015) have found that beneficiaries of the Troubled Assets Relief Program (TARP) in the US enjoyed a competitive advantage, which led them to increase loan-market shares and market power. In a similar vein, Poczter, (2016) has shown that state recapitalizations stimulate lending for its recipients. Overall, theoretical and empirical studies have concluded that banks' capital has a positive effect on market share as well as on their ability to compete (Allen, Carletti, & Marquez, 2011; Berger & Bouwman, 2013; Mehran & Thakor, 2011). Consequently, increasing banks' capital through recapitalization might generate a competitive advantage. Furthermore, following Berger & Roman, (2015), since recapitalized banks increased their lending market shares, their underwriting business could also have benefited, due to the link between lending and underwriting. Therefore, strengthening banks' capital may generate a competitive advantage that would lead recipients of state aid recapitalization measures to increase their market shares.

However, as previous studies on financial markets have suggested, the impact of state aid measures on market shares might differ in accordance with underwriter reputation, since the effect of reputational capital could differ between more and less reputable intermediaries.

In a recent paper, Chen, Morrison, & Wilhelm, (2015) present a model in which the concept of 'reputation' is dissected. These authors distinguish between reputation based on competence ("type reputation") and on ethical behavior ("behavioral reputation"). Their model points out that while in a stable situation well-established banks preserve their reputation, even foregoing opportunities to differentiate themselves, less reputable banks with little to gain from a behavioral reputation are more willing to take

risks in order to build a type reputation. Ljungqvist et al., (2006)'s model suggests that incentives of reputation capital may differ among banks with different levels of reputability. Furthermore, Dunbar (2000) provides empirical evidence that factors affect market shares differently, depending on whether the bank is well established. In a similar vein, Gopalan, Nanda, & Yerramilli, (2011) find differential effects between large and small lead arrangers in the syndicate loan market, which they interpret as a key limitation of the reputation mechanism.

According to the theory on underwriter reputation, more reputable financial intermediaries with a large amount of reputational capital have stronger reputational concerns. Therefore, the effect of being a recipient of state aid for recapitalization would be larger for more reputable banks because they have more to lose; especially if receiving state aid negatively impacts market shares. However, for less reputable banks that do not have reputational capital, a public capital injection may act as a competitive advantage. Therefore, the effect of receiving state aid would differ (either increasing or decreasing market shares) for highly reputable and for less reputable banks. Hence, highly reputable banks may increase (decrease) their market shares after receiving a public capital injection, while for less reputable banks these market shares may decrease (increase).

4.4. Data and methodology

4.4.1. Data and descriptive statistics

Our primary data source is a sample of non-financial corporate bonds issued in Europe from January 1, 2006 to January 1, 2014, collected from the Dealogic Debt Capital Markets database. This database offers detailed information of bonds' characteristics and details all banks participating in the deal. The sample comprises fixed non-perpetual corporate bonds issues, excluding deals issued by utilities and regulated firms (SIC:

4000s) and financial firms (SIC: 6000s). The database construction and some summary statistics are offered in Table 4.1. The sample consists of 2,457 bonds underwritten in 24 European countries[67] during 2006–2013, representing a total of $1,272,233.82 million. Bonds are underwritten by an average of 3.14 underwriters, with average issue size equal to $517.80 million. Average annual yield at offering is 5.15%, and maturity is 7.81 years.

Using this corporate bond data, we built a panel of underwriters issuing fixed corporate bonds in Europe from 2007–2013[68], which allows us to explore the effects of the banking crisis, in addition to covering all of the bailout programs undertaken as a consequence of the financial turmoil. In order to do so, we first match the Dealogic dataset with banks' balance information provided by Bankscope. Then, with the aim of providing insight about the lender role of each underwriter, we include underwriters' lending information in the syndicate loan market using Thomson ONE. This results in unique panel data on 121 bonds' underwriters, with detailed information about their bonds placed alongside their lending relationships from 2007–2013.

We followed the methodology employed in Huyghebaert & Xu, (2015) to cope with some mergers and acquisitions that took place during the sample period. In doing so, merger information was collected from Bankscope, Lexis-Nexis and banks' own information sources[69]. For example, if one underwriter has acquired another bank, we use different codes for the acquired bank and the acquirer before the acquisition, while the acquirer bank's code is used after the acquisition. Moreover, if two banks merge to form a new bank, we employ a different code for the bank created after the merger. Finally,

[67] Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, and United Kingdom.

[68] Our sample of bonds starts in January 2006, but as we use as independent variable the lagged market share, our estimations are made from 2007.

[69] We identify prior lending and underwriting relationships accounting for mergers between underwriters. For example, for 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.

name changes in which no merger or takeover were involved are considered, but we use the same code before and after the name's change.

Table 4.2. indicates the yearly distribution of our panel of underwriters in each year, as well as the top five underwriters by market share. We consider an underwriter as active if it has placed at least one deal during the year in question. As expected, our data reveal that the number of active underwriters rose from 38 in 2006 to 94 in 2013. Furthermore, the table leagues' rankings are led each year by the well-established large banks, namely Deutsche Bank, Barclays, JP Morgan, HSBC, Citi, BNP Paribas, RBS, and Société Générale. Finally, it is worth mentioning that our panel reflects the evolution of the average market share – from 2.69% in 2006 to 1.10% in 2013.

4.4.2. Empirical modelling

4.4.2.1. Determinants of market share

In order to address our main research question, we rely on the following equation:

$$Mkt.Share_{i,t} = \alpha + \beta_1 Mkt.Share_{i,t-1} + \beta_2 Pricing\ Factors_{i,t-1} + \beta_3 Non-Pricing\ Factors_{i,t-1} + \beta_4 Lending_{i,t} + \beta_6 Year_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

We adopt a panel data methodology to estimate (1), where the market share of underwriter *i* at time *t* is explained. The regressors include the lagged dependent variable, as reputation is not generated instantaneously. Underwriters' current competitive behavior is likely to be a function of underwriters' prior reputation. The reputation acquisition mechanism in the theoretical literature (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994) agrees that highly reputable underwriters attain this status due to outstanding past performances. Reputation is built over time, but it can be also damaged, since banks' opportunistic

behavior (using their informational advantage for their own benefit) is likely to negatively affect reputation.

There is also empirical evidence showing that reputation is built (or eroded) over time (Beatty et al., 1998; Dunbar, 2000; Huyghebaert & Xu, 2015; Rau, 2000). This has led a number of researchers to adopt a dynamic specification similar to equation (1) in similar contexts (Athanasoglou, Brissimis, & Delis, 2008; Goddard, Molyneux, & Wilson, 2004; Wu, Luca, & Nam, 2011).

Econometrically, including the lagged dependent variable as an explanatory variable introduces concerns of a potential endogeneity bias. In order to address this problem, we use a generalized method of moments (GMM) approach. Among GMM models, we rely on Arellano & Bover, (1995) and Blundell & Bond, (1998) in estimating two equations: an equation in differences and an equation in levels, where the lagged values of the variables in differences can be used as instruments for the equation in levels, and the lagged values of the equation in levels are used as instruments for the equation in differences. We undertake a two-step system GMM estimator. This tends to be more efficient than the one-step GMM estimator, since the residuals from the first step are used to obtain a consistent estimation, allowing for dependence and heteroscedasticity among the errors terms. Finally, in order to deal with the biased downwards standard errors that the two-step estimator generates in finite samples, we employ the correction proposed in Windmeijer, (2005).

4.4.2.2. Effects of state aid recapitalization

The effects of state aid recapitalization on underwriters' market share are examined using a DID analysis. The idea is to compare state-aid-recapitalized underwriters to non-recapitalized underwriters during the financial crisis. Recent studies have used a similar approach to examine the effects of state capital injections in the

banking sector (Berger & Roman, 2015; Black & Hazelwood, 2013; Duchin & Sosyura, 2014; Montgomery & Takahashi, 2014; Nakashima, 2016; Poczter, 2016). By employing this approach, we control for observable and unobservable factors that affect both groups of banks.

Our treated group consists of underwriters that were recipients of equity state aids from September 2008 to December 2010. In line with prior studies (Berger & Roman, 2015; Berger & Roman, 2016; Montgomery & Takahashi, 2014), this treatment starts at the collapse of Lehman Brothers, as the triggering event of the financial crisis, and finishes in December 2010 when the bulk of state aid recapitalization programs came to an end. The treatment period encompasses the entire TARP program in the US (October 2008–October 2010), as well as the bulk of the recapitalization programs in Europe.

In order to examine the effects of state aid recapitalization on underwriters' market share, we employ an equation similar to Berger & Roman, (2015, 2016):

$$Mkt.Share_{it} = \alpha + \beta_1 Recapit_i + \beta_2 Post - Treatment\ Period_t x\ Recapit_i + \beta_3 CONTROLS_{it-1} + \beta_4 TIME_t + \varepsilon_{it} \quad (2)$$

The dependent variable is the market share of underwriter *i* in year *t*. $Recapit_i$ is a dummy that takes the value 1 for the treated group. $Post - Treatment\ Period_t$ is a dummy that takes the value 1 from September 2008 to December 2013, while it takes the value 0 from January 2006 to September 2008. Consistent with the DID approach, in our regressions we exclude those banks that received a first state capital injection after the treatment period ended in December 2010[70]. Thus, $Post - Treatment\ Period_t x\ Recapit_i$ is the DID term.

[70] Five banks were removed: Abanka Vipa, Banco BPI, Banco Grupo Cajatres, Millenium Investment Banking, and Nova Ljubljanska Banka.

Then, in order to explore how the effect on market shares varies depending on the current level of reputation, we employ the following equation, interacting the main variables in (2) with the recapitalization dummies:

$$Mkt.Share_{it} = \alpha + \beta_1\, Recapit\ Reputabl_{\ i} + \beta_2 Recapit_i\, Non\ Reputabl_{\ i} + \beta_3\, Post - Recapital_t x\ Recapit\ Reputable_i + \beta_4\, Post - Recapital_t x\ Non - Recapit\ Reputabl_{\ i} + \beta_5 X_{it-1} + \beta_4 TIME_t + \varepsilon_{it} \quad (3)$$

4.4.3. Variables

4.4.3.1. Dependent variable: Market share

We employ *market share* as proxy for underwriter reputation. Market shares are computed on a proceeds base, in which proceeds of syndicated bonds are split among all the underwriters.

One concern about using market share as proxy for underwriter reputation in Europe could be a fragmented market at a national level, as Vismara et al., (2012) find for IPOs. In this sense, the presence of national local underwriters that operate almost entirely in a single country would bias our result, because their reputation would be high in their domestic market, but lower abroad. Although European debt markets seem to be less fragmented than IPO markets, we address this issue in our paper. In order to detect possible bias, we compute bonds denominated in the national currency of the issuer, underwritten by domestic banks and sold into the domestic market. In general, as Table A.4.1. reveals, while IPOs are chiefly domestic deals placed by a single underwriter, bonds are typically marketed internationally by a syndicate. In our sample, these bonds

represent just 4% by proceeds and 12% (288 bonds out of 2,457) by number of deals. Domestic bonds are on average smaller in size[71].

Furthermore, following Migliorati & Vismara, (2014), we compute the national rankings for the core European economies (Germany, United Kingdom, France, Italy, and Spain) with the aim of detecting if there are local national underwriters (banks with large market shares in their domestic market but low market shares in the whole region). Table A.4.1. shows by country all the underwriters with a global market share lower than 1%. These underwriters have similar characteristics: reduced low market shares abroad and in their domestic markets. Therefore, according to the characteristics of banks with a market share lower than 1% it seems that there are not national underwriters among them[72].

Moreover, we perform a matched-pairs t-test on means equality[73] between national rankings, and do not find evidence of differences across national markets. Finally, large differences across national markets would likely lead to differences in market structure. Thus, we compute the traditional Herfindahl-Hirschman Index for each market, and do not find noticeable differences among markets. Hence, as in other studies, market shares are used, since we present evidence of a non-fragmented European underwriting industry for corporate bonds.

4.4.3.2. Explanatory variables

4.4.3.2.1. Pricing: Abnormal fees

Following the most closely related studies on investment bank market shares (Dunbar, 2000; Huyghebaert & Xu, 2015), we build a variable called "abnormal fees" in

[71] In our sample, the average issue volume of domestic bonds is $157.69 million, while for non-domestic bonds the average size is $565.61 million.
[72] For example, we can see that the largest market shares in a domestic market – held by the Italian bank Mediobanca: 3.42% – does not place this bank among the top positions of the Italian ranking. Moreover, this bank has a presence in other markets, such as the French and the German markets.
[73] $H_0 : \mu_{country\ i} = \mu_{Europe}$; i=France, Germany, United Kingdom, Italy, and Spain.

order to account for a pricing strategy. Gross fees charged by underwriters, including selling, management and other chargeable fees related to the placement, are expressed as a percentage of the proceeds.

We employ a standard model on fees charged in the European corporate bond market. Bond proceeds and its logarithm are included to account for a non-linear relationship. We also account for bond length, as risk and placement complexity increases as bond maturity increases. Furthermore, bond complexity is also likely to be larger in callable bonds than in non-callable bonds, as there is a reinvestment risk for investors buying bonds with this call option. Bonds' quality is also considered through the inclusion of a dummy that takes the value 1 if the bond is a high-yield bond. Finally, we also account for bondholders' protection by including a dummy for bonds that include a negative pledge clause[74]. Using Ordinary Least Square (OLS) regressions, we run a separate regression for each year using all fees charged in a three-year rolling window as dependent variable. Industry dummies and country dummies based on deals' nationalities are also considered:

$$Fees\ (in\ \%\ of\ gross\ proceeds) = \alpha + \beta_1 Proceeds + \beta_2 ln(Proceeds) + \beta_3 \ln(Maturity) + \beta_4 Callable\ Bond + \beta_5 High - Yield\ Bond + \beta_6 Domestic + \beta_7 Neg.Pledge\ Issuer + Industry\ Dummies + Country\ Dummies + e_i \quad (4)$$

Table 4.3. presents the results of the OLS regressions. Using the coefficients from the annual regressions, we predict fees that are then subtracted from the observed fees, obtaining an "abnormal fees" value for each observation. Larger differences between the observed and the predicted fees indicate that the underwriter is likely to be using a pricing

[74] A negative pledge clause is a provision that prohibits the issuer creating another security in the future using the bond as security for another debt obligation. This provision serves as a protection clause for bondholders.

strategy. Finally, for each underwriter we compute the average abnormal fees charged in a three-year window[75] using the gross proceeds as weighting factor.

4.4.3.2.2. Non-pricing: Star analyst coverage

As in other studies, star analyst coverage is proxied by the Institutional Investor awards (Abrahamson et al., 2011; Drucker & Puri, 2005; L. Fang & Yasuda, 2009; Franck & Kerl, 2013; Kovner, 2012). We track All-Europe Fixed-Income Research Team awards[76] from 2006–2013. Based on these rankings, we build a variable *Number Star Analyst* that accounts for the number of analysts reported on by Institutional Investor for each underwriter. Furthermore, we build an indicator variable *Star Analyst* that equals 1 if there is at least one reported-on star analyst working for the underwriter. Finally, although all the analysts that are shortlisted are considered to be reputable, in order to account for the higher reputation that is entailed by being listed as number 1, we build a numerical variable *Weighted Star Analyst* following the procedure employed by Institutional Investor, which adds 4 points if the analyst is placed first, 3 points if the analyst is placed second, 2 points if the analyst is placed third, and 1 if she/he is considered a runner-up.

4.4.3.2.3. Non-pricing: Lending relationships

In order to analyze how underwriting market share might be affected by the provision of joint underwriting and lending services, we employ two different variables: *lending market share* and *UW Lender*.

Using Thomson ONE as primary data source, we compute the market share of each underwriter as lead manager in the European syndicate loan market. In multiple

[75] Alternatively, for robustness purposes in unreported regressions, we have computed abnormal fees using a two-year window. Similar results are obtained in these regressions.
[76] Institutional Investor surveys 21 sectors and provides the top-ranked analysts. This magazine classifies the ranked analysts into several categories – first, second, third, and runner-up.

syndicated loans, loan proceeds are divided equally among all lead managers. This variable allows us to examine how underwriters' presence in the credit markets might influence their underwriting market share.

Moreover, we examine whether the provision of simultaneous lending and underwriting services to a specific issuer is likely to affect the underwriting market share. We have therefore tracked issuer-banks' underwriting and lending relationships, accounting for mergers and acquisitions, to build an indicator variable. *UW Lender* is equal to 1 when the underwriter is also the lead manager in a loan issued by a firm in the same natural year. By including this variable in our model, we account for those banks that simultaneously provide lending and underwriting services to their clients.

4.4.3.2.4. Other non-pricing factors: Industry specialization and diversification

In order to test how degree of specialization could affect market share, we use different measures. First of all, we control for underwriters' industry specialization by computing a Herfindahl-Hirschman index for each underwriter[77]. This index measures the concentration of each underwriter's activity across all the industries in which it operates. A large value means that the underwriter concentrates its activity in a few industries. However, although this index is widely used, it assigns higher weights to higher shares. Thus, we compute an alternative measure of diversification that assigns lower weights to higher shares, namely the Shannon Entropy index Shannon, (1948)[78]. In this case, a positive and significant value would mean that underwriters with large market shares are those that diversify their activity across several industries.

[77] $UW_i HHI = \sum_{j=1}^{n} \left(\frac{g_{ij}}{G_i}\right)^2$. g_{ij} is the gross proceeds issued by the underwriter "i" in the two-digit SIC-industry "j", and G_i is the total gross proceeds issued by the underwriter "i".

[78] $UW_i Entropy = \sum_{j=1}^{n} \left(\frac{g_{ij}}{G_i}\right) \ln\left(\frac{G_i}{g_{ij}}\right)$ where g_{ij} is the gross proceeds issued by the underwriter "i" in the two-digit SIC-industry "j", and G_i is the total gross proceeds issued by the underwriter "i".

Finally, following Chen et al., (2014), we compute an index of underwriter industry dominance that reflects underwriters' leadership in each industry[79]. In this case, we calculate how being a market leader in a specific industry could affect global underwriting market share. If a few industries originate most issuances, being leader in other industries might not lead to have a large total market share. This measure cannot be considered as a specialization measure; rather, it is an underwriter dominance measure, because it reflects underwriters' market shares in the industries in which they operate.

4.4.3.2.5. Other non-pricing factors: Abnormal bond spreads

Similarly to underwriting fees, we build a variable called "abnormal spread" by employing a standard model on bonds' spreads in the European corporate bond market. Spreads at launch, which is the difference between the bond yields and a benchmark treasury bond, are expressed in basis points. Similarly to fees, bond spreads are estimated using a three-year rolling window. The estimation results are reported in Table 4.4.

$$Spread\ (in\ bps) = \alpha + \beta_1 Proceeds + \beta_2 ln(Proceeds) + \beta_3 \ln(Maturity) + \beta_4 Callable\ Bond + \beta_5 High - Yield\ Bond + \beta_6 Domestic\ Bond + \beta_7 Neg.Pledge\ Issuer + Industry\ Dummies + Country\ Dummies + e_i \quad (5)$$

After obtaining the predicted spreads, we subtract them from the observed spreads, thus computing the "abnormal spread" value for each bond. As before, we compute the average abnormal spreads obtained for each underwriter in a three-year window[80] using the gross proceeds as weighting factor.

[79] $UW_i Dominance = \sum_{j=1}^{n} \left(\frac{g_{ij}}{G_j}\right)^2$ where g_{ij} is the gross proceeds issued by the underwriter "i" in the two-digit SIC-industry "j", and G_j is the total gross proceeds issued in industry "j".

[80] Alternatively, for robustness purposes in unreported regressions, we have computed abnormal spreads using a two-year window.

4.4.3.2.6. State aid recapitalization

As far as we know, there is no updated database listing all the financial institutions that were bailed out during the recent financial crisis. Data are dispersed, since these measures were adopted by different national governments and supranational institutions according to their respective competencies. Therefore, we hand-collected data from several sources depending on the nationality of the underwriter.

- EU underwriters: *Data source*: European Commission. State Aid Control.

  The European Commission has a State Aid Control Section, which is primarily integrated by the Directorate-General for Competition[81]. All the state aids are publicly viewable through a multi-criteria search tool that provides access to all the cases that have been objects of a Commission decision since 1 January 2000[82]. Using this tool, we have tracked all the state aids granted in the EU to financial firms during our research period (*K.64 Financial service activities*).

- U.S. underwriters: *Data source:* Emergency Economic Stabilization Act TARP. U.S. Department of the Treasury.

  In October 2008, the U.S. Congress authorized a Troubled Asset Relief Program (TARP) with a maximum amount of $700 billion to buy assets and equity from financial institutions with the aim of increasing the stability of the financial sector. We have tracked all the programs[83] approved under the TARP in order to determine which U.S. banks were bailed out during our research period.

[81] Article 107 of the Treaty on the Functioning of the European Union (TFEU) contains a general prohibition of state aids in order to not distort competition and trade within the EU. However, under some circumstances, governments can intervene to offset market failure. With the aim of controlling these aids, the European Commission created the State Aid Control Section.

[82] http://ec.europa.eu/competition/elojade/isef/index.cfm

[83] Programs approved under the TARP: Capital Purchase Program (CPP), Automotive Industry Financing Program (AIFP), AIG Investment Program, Targeted Investment Program (TIP), Mortgage Loan Modification Plan, Public-Private Investment Program (PIP), Housing Finance Agency Innovation Fund, FHA Refinance Program, Community Development Capital Initiative (CDCI), Auto Supplier Support Program, Small Business and Community Lending Initiative, Term Asset-Backed Securities Loan Facility (TALF), Asset Guarantee Program (AGP), Securities Purchase Program, Supervisory Capital Assessment Program (SCAP), and Capital Assistance Program (CAP).

- Swiss underwriters: *Data source*: Swiss National Bank (SNB).

  Under the National Bank Act, the SNB conducts the monetary policy for the nation, as well as contributing to the stability of the financial system.

- Other underwriters: *Data source:* Publicly available data sources (central banks, governments, bank websites, treasuries, and restructuring agencies).

Following earlier studies, we generate annual dummies which take the value 1 if the underwriter bank has received an equity state injection considered as eligible Core Tier 1 Capital. In the Appendix section, Table B.4.1. describes all the recapitalization processes implemented concerning our sample underwriters[84]. From 2006–2013, we report 64 recapitalization measures concerning 36 banks with a total amount of over €350 billion. As some banks are recipients of more than one recapitalization measure during the same natural year, we end up with 55 year-recapitalization observations. As expected, most of these recapitalizations took place during the short period starting in September 2008, after the collapse of Lehman Brothers, and ending in December 2010. During this period, the structural deficit in the Eurozone reached 15% of GDP, and the European sovereign debt crisis started. After December 2010, there were just amendments of previously approved recapitalization measures, as Table B.4.1. shows.

4.4.3.2.7. Other control variables

We also include a further set of controls with the aim of accounting for additional deal and underwriter features to ensure that the main results do not hinge upon omitting variables. We control for *private placements* with the weighted ratio of placement deals, since being highly active in placing these deals might reflect a capacity to attract sophisticated investors who could also attract issuers. Additionally, we control for

[84] For example, the German bank HSH Nordbank was recapitalized in 2008 and 2009, but it does not appear on the list because it did not place any corporate bonds during 2007–2013.

multiple underwritten deals with the weighted ratio of these deals. In this way, we control for the possibility that participating in syndicates could affect market share, since, as investment bankers report, underwriting syndication is considered a response to issuers' demand.

Furthermore, as in other studies, we also include a set of underwriters' characteristics that accounts for their financial strength. All these variables, which were retrieved from Bankscope, are included with the aim of reflecting the link between financial strength and the generation of competitive advantages, as this might lead to differences in market shares. Therefore, we employ a set of financial ratios to account for the different dimensions of the underwriter: size, profitability, liquidity, efficiency, and capital adequacy. Lastly, we also control for underwriters' experience by taking into account the number of years since their first placement, as well as if they are listed on a stock exchange market[85].

4.5. Results

4.5.1. Empirical findings on the determinants of market shares

Table 4.5. presents the results of the estimations of equation (1). The positive and significant coefficient of prior market share in all the specifications confirms that current market share is a function of previous market share. Importantly, in order to check the validity of the instruments, we do not reject the null hypothesis of the Hansen test, so there is no correlation between the instruments and the error term. Additionally, we check for the absence of serial correlation of the error term, allowing for first-order but not second-order serial correlation of the differenced error term. Finally, the p-values of the

[85] All the variables are described in Table A.II.

difference-in-Hansen tests confirm that the additional subset of instruments used in the system GMM estimates is exogenous.

Regarding the pricing factor –of abnormal fees, in spite of a negative coefficient, we do not find evidence of a pricing strategy based on charging abnormal fees. Thus, abnormal fees are not related to holding a large market share. These results are in line with prior findings that have shown that while in the US there was evidence of strategic pricing, this was not the case in Europe (Abrahamson et al., 2011; Ljungqvist & Jenkinson, 2003; Torstila, 2003). Therefore, our findings suggest that the European underwriting debt markets are not dominated by fee-based competition. Cuts on underwriting fees in Europe from 2007 onwards are likely to be the result of the increased competition in the whole industry, but did not have an impact on market shares.

However, as expected, we find that non-pricing factors are likely to affect underwriters' market shares. Regarding star analyst coverage, we find a positive impact on market shares. Both variables reflecting star analyst coverage, namely total and weighted number of star analysts, exhibit a positive and significant coefficient. This result suggests that hiring highly reputable analysts with extensive knowledge of markets' evolution attracts business. However, the positive but non-significant coefficient of the variable that reflects the presence of at least one star analyst suggests that the single presence of a star analyst does not positively affect market shares. Consequently, this result suggests that in the underwriting industry what makes a difference in terms of the research phase is how well-built the research team is; rather than just having a single star analyst. Thus, even if less reputable banks could hire a star analyst to foster their market shares, it is the team that seems to be valuable.

In addition to this finding, our results support that there is connection between lending relationships and the underwriting industry, as the recent evolution of the

underwriting industry suggests. According to the positive coefficient of *lending market share*, underwriters with a relevant lending arm are likely to hold large market shares in the underwriting business. This result reveals that pure investment banks should be concerned about the potential competitors that lurk within the large commercial and universal banks.

Furthermore, the *UW Lender* variable is also positive, which means that banks that provide joint lending and underwriting services for a specific issuer hold larger market shares. These results are in line with prior investigations that report that firms' relationships are built through lending and debt transactions (Corwin & Stegemoller, 2014). Taken together, these results suggest that combining lending and underwriting seems to generate positive outcomes for banks. While some studies have discussed the joint provision of these services (Kanatas & Qi, 2003; Kang & Liu, 2007; Kim et al., 2009; Shivdasani & Song, 2011), we find evidence of their relevance in generating business.

Finally, regarding bond pricing, the coefficient on average abnormal spreads is not significant[86], as could be expected for debt issues in Europe (Jenkinson, Morrison, & Wilhelm, 2006; Krakstad & Molnár, 2014; Ritter, 2003). In European bond markets, a strategic bond valuation does not seem to affect market shares. As for the specialization and diversification variables, contrary to the information spillover hypothesis, we find that neither the industry specialization measure nor the entropy measures are significant. This result complements our finding about joint lending and underwriting. While in the past being specialized was valuable for underwriters, the proliferation of universal banks providing many financial services suggests that issuers' demand does not favor being specialized. Moreover, we find a positive significant coefficient for underwriters'

[86] In non-reported robustness checks, we employ the average abnormal spreads in a two–year window, but the coefficient remains non-significant.

dominance. This result suggests that being a market leader within an industry could affect global market share in the underwriting industry. Therefore, being specialized is less important than transforming specialization into leadership within the industry as a means of winning business from other related industries.

4.5.2. Empirical findings on the impact of state aid recapitalization

The DID estimations are presented in Table 4.6. This regression includes those factors of equation (1) explaining market shares, as well as a set of underwriter features. Column 1 reports the results for the regression of Equation 2, while in column 2 we can find the results for Equation 3. Regarding our main variables in Equation 2, we find that *Recapitalized* is negative but not significant. This result suggests that recapitalized banks had on average lower market shares compared to non-recapitalized banks, but this difference is not statistically significant. Thus, recapitalized banks and non-recapitalized banks do not have statistically different market shares. This finding confirms that not only medium and small banks with small market shares were recipients of state aid recapitalization measures. In a sense, this result was expected, since the financial crisis had a global effect on the financial system. It affected large banks (Citigroup, Goldman Sachs, and RBS) as well as small banks (Alpha Bank, IKB Deutsche Industriebank, and Parex Banka); all of them being recipients of state aid recapitalization measures.

With regard to the DID term, we obtain a positive but not statistically significant coefficient. Compared to non-recapitalized banks, recapitalized banks did not increase their market share after receiving state aid. However, this result should be analyzed simultaneously with the results of column 2, in which the effect on market shares of being recapitalized is disentangled by underwriter reputation. In this regard, for Equation 3 we find that the DID term for reputable underwriters (*Post-Treatment*Rep. Recapitalized)* is negative and statistically significant, while the DID term for non-reputable underwriters

(*Post-Treatment*Not Rep. Recapitalized)* is positive and statistically significant. These results indicate a differential effect of state aid recapitalization by underwriter reputation. While reputable recapitalized banks suffered losses in their market shares after state aid recapitalization, non-reputable recapitalized underwriters increased their market shares after receiving state aid. Therefore, the effect of state aid depends on the underwriter's prior reputation level. Reputable underwriters' losses in market share are consistent with a reputational hypothesis. Underwriters with much reputational capital are more likely to have their market shares decrease when the state has to recapitalize them. Conversely, those underwriters that do not have reputational capital cannot lose it, so for them being recapitalized by state aid serves as a competitive advantage. Overall, these opposite effects compensate for each other, as the non-significant differences in equation 2 reveal. Furthermore, in this second column we find that the term *Reputable Recapitalized* is positive and significant, which could be expected, since more reputable underwriters hold larger market shares than non-reputable underwriters do.

This result is economically significant, since the market share of a reputable recapitalized underwriter decreases by 22.66% from the median market share value (21.65% from the average market share). At the same time, the market share of a non-reputable recapitalized underwriter increases by 63.66% from the median market share value.

Moreover, the results obtained in column 1 of Table 4.6. are robust with those obtained in Table 4.5. *Abnormal spreads and abnormal fees* remain non-significant, while the impact of lending relationships on underwriting market shares is also revealed due to the positive and significant coefficient of *UW Lender* and *Lending market share*. Furthermore, hiring star analysts for the underwriting team significantly increases

underwriters' market shares, since the coefficient of *number of star analysts* is positive and statistically significant.

4.5.3. Robustness tests

4.5.3.1. Alternative market share measures

In our main results, as in earlier studies, underwriters' market shares are computed using bonds' proceeds. However, our primary concern is to ensure that our results have not been driven by how underwriters' market shares are computed. Hence, for robustness purposes, we use alternative measures of underwriters' market shares.

We employ two alternative market share measures: market share deals and market share full proceeds. *Market share deals* is the number of deals placed by each underwriter, instead of the total amount of proceeds. In order to compute this alternative measure, we divide the number of bonds placed by each underwriter in the year by the total number of bonds placed during that specific year. Moreover, we also employ *market share full proceeds*. This is a variable calculated using the amount of proceeds placed; when there are several underwriters placing the bond, all the proceeds are given to each of them.

Table 4.7. presents the estimation results using these alternative measures for Equation 1. Our main results are consistent with the main findings reported in Table 4.5. and 4.6. In both cases, the lagged dependent variable is positive and statistically significant, confirming the dynamic specification. Additionally, the pricing factor as well as the industry specialization measure are non-significant, as before. Furthermore, the coefficient of the number of star analysts is positive, in line with the impact of the research team on market shares. Finally, as expected, the variables related to lending continue to exhibit links between underwriting and lending[87].

[87] In unreported regressions, available upon request, we have also included other variables, namely *Entropy, Industry Dominance, weighted star analyst* and *star analysts(dummy)*, as well as *abnormal fees* and *abnormal bond spreads*, using a two-year window. The results are qualitatively and quantitatively similar.

Then, for the DID regression, columns 1 and 5 of Table 4.8. present the estimation results for Equations 1 and 2 using the alternative measures. In both cases, our main results are consistent with the main findings reported in Table 4.6. The DID terms are not statistically significant in Equation 1, while the DID terms for reputable recapitalized and non-reputable recapitalized underwriters remain both significantly negative and positive, respectively. This shows that reputable recapitalized underwriters decreased their market shares (no matter if it is computed using full proceeds or apportioned proceeds) in the underwriting industry after receiving a state recapitalization measure.

4.5.3.2. Subsample: Active underwriters

We are also concerned about the fact that some underwriters placed bonds in some but not all years of the research period of 2006–2013. Therefore, in order to ensure that our results have not been driven by the possibility that some banks placed bonds at particular moments due to specific isolated mandates, we have re-estimated our model using a subsample of banks with a positive market share during all of the research period – that is, banks placing bonds every single year from 2006 to 2013.

In columns 3 and 4 of Table 4.7, we present the results on the subsample of active underwriters placing at least one bond per year. The total number of observations diminished from 823 to 421. The model remains to be correctly specified according to the Hansen and the serial correlation. In general, our results are qualitatively robust. In both columns, we observe that the lagged dependent variable is positive and statistically significant. The findings are consistent with those documented in Table 4.5: the coefficients of our main independent variables remain significant with the same sign.

Additionally, we have re-estimated DID equations on this subsample of banks. The total number of observations diminished from 794 to 425. In general, our results are qualitatively robust: the DID terms are statistically significant with the expected signs.

4.5.3.3. Alternative reputation measures

Finally, although considering as reputable those underwriters ranked in the top five seems reasonable[88], another set of robustness checks refers to the reputation measures in Equation 3 of the DID approach. One issue that could affect the validity of our result is considering as reputable just those underwriters ranked in the top five in the annual underwriter leagues. Therefore, we have re-estimated Equation 3 using other reputation measures to ensure that the main results do not hinge upon comparing the top five annual underwriters with the rest. Hence, we have built two different measures of reputation: *Top 3*, which is a more strict reputational measure, and *Top 15*, which extends the reputational measurement.

Consistent with the reputational hypothesis, if employing a more strict reputational measure, we would expect highly reputable underwriters to experience losses in market shares after being recapitalized. In line with our main results, using *Top 3* as a reputation measure, we find that our results are qualitatively and quantitatively similar. We find that highly reputable underwriters (top 3) decrease their market share by around 25% from the median market share (8.56) after being state-aid recapitalized. The coefficient of the DID term for non-reputable recapitalized underwriters is also positive and statistically significant, but at the 10% level; which could be expected since now the fourth and fifth top-ranked underwriters are considered non-reputable. As mentioned above, the reputational hypothesis is accepted for these underwriters, since they are highly reputable.

Additionally, we employ an expanded reputation measure *Top 15,* considering as reputable those underwriters in the top 15 in the annual league tables. Since now more

[88] As the European fixed corporate bond market is less concentrated than that of the US, considering reputable those in the top five is consistent with analyzing the effects for those reputable underwriters during 2006–2013.

banks are part of the group of reputable underwriters, the level of reputation has decreased. Consequently, it is likely that the reputational hypothesis would be rejected, since in this group there are underwriters with lower levels of reputation. The results using this measure are reported in column 4 of Table 4.8. As predicted, the DID term for reputable recapitalized underwriters is not statistically significant, while the term for the non-reputable underwriters is significant. This result suggests that only the truly reputable underwriters – those with a large reputational capital – are likely to suffer losses in market shares.

4.6. Conclusions

Underwriting has become a substantial revenue generation activity for banks that compete to acquire reputational capital. All market participants – issuers, investors, analysts, rating agencies, and underwriters – recognize reputable underwriters as those holding large market shares, and winning underwriting mandates ultimately depends on a set of quantitative and qualitative factors.

In this paper, we explored what explains underwriters' market shares in corporate debt issuance. Therefore, this research contributes to the literature on reputation by studying the relative impact of pricing and non-pricing factors on underwriting market shares. Along with the usual pricing variables (fees, yields), we included a number of non-pricing factors, including the presence of star analysts in the underwriting team, as well as the joint provision of lending and underwriting services. Furthermore, as the generalization of underwriting services among commercial banks (along with investment banks) took place during the financial crisis, we examined the impact that state capital injections may have had on reputation. An investigation of the effects of state aid recapitalization measures is relevant, since according to the reputational hypothesis the information disclosed about beneficiaries might affect their future business.

Using a dynamic approach, we did not find evidence that pricing competition was the key driver of underwriters' market shares in Europe from 2007 to 2013. However, non-pricing factors seem to play a significant role in explaining market shares. We found that reputable underwriters are those that have star analysts on their underwriting teams, in addition to providing joint lending and underwriting services. As the recent evolution in the underwriting industry seems to suggest, relationships are built through both lending and underwriting. Additionally, using a DID approach, we found that reputable underwriters suffered losses in their underwriting market shares after being state-aid recapitalized, while state aid recapitalization increased the market share of non-reputable underwriters. These results, consistent with the reputational hypothesis, were found to be robust to different identification and measurement tests.

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Table 4.1.
Database construction and sample summary statistics

Bond Characteristics	Dealogic	Excluding Utilities, Regulated (SIC:4000S) and Financial Firms			
Sample					
Bond			**Distribution**		
	Mean	**Median**	**Year**	**Number**	**Total Proceeds ($ mill)**
Proceeds ($ mill)	517.80	390.63	**2006**	156	81892.99
Maturity (years)	7.81	7.00	**2007**	139	88383.49
Yield (%)	5.15	4.81	**2008**	153	89674.85
Investment Grade	0.78	1.00	**2009**	318	239092.20
Callable	0.28	0.00	**2010**	310	144686.76
Collateralized	0.09	0.00	**2011**	334	149116.41
Private placement	0.19	0.00	**2012**	526	242866.38
Cross Default Issuer	0.31	0.00	**2013**	521	236520.71
Rule 144A	0.18	0.00	**Total**	2457	1272233.83
Nº UW	3.14	3.00	**Issuer**	446	
Nº Co-Managers	0.71	0.00	**Nationality**	24	
			Deals	1874	
			Tranches	2457	

Table 4.2.
Summary statistics of the underwriting European corporate bond market

		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Ranking	1	Deutsche Bank	Deutsche Bank	RBS	Deutsche Bank	Deutsche Bank	Deutsche Bank	HSBC	Deutsche Bank
	2	JPMorgan	Citi	Deutsche Bank	RBS	Barclays	RBS	Barclays	HSBC
	3	Barclays	HSBC	BNP Paribas	BNP Paribas	BNP Paribas	Citi	RBS	BNP Paribas
	4	Morgan Stanley	JPMorgan	HSBC	Societe Generale	RBS	BNP Paribas	Deutsche Bank	JPMorgan
	5	Citi	BNP Paribas	JPMorgan	HSBC	HSBC	JPMorgan	BNP Paribas	Barclays
Active Underwriters		38	41	48	58	62	63	74	94
Total nº of bonds		119	113	131	242	235	235	375	397
Total proceeds raised (mill.$)		81181.55	88297.53	88195.37	238553.97	144511.97	149058.70	242770.41	236520.71
Average UW market share		2.69	2.50	2.17	1.81	1.69	1.67	1.41	1.10
Median UW market share		0.64	1.67	0.53	0.35	0.60	0.54	0.24	0.19
HHI (UW)		0.0684	0.0599	0.0762	0.0601	0.0500	0.0486	0.0443	0.0417
Average Lending market share		1.74	1.78	1.52	1.32	1.23	1.30	1.09	0.87
Median Lending market share		1.30	1.19	1.07	0.63	0.68	0.71	0.55	0.29

Figure 4.1.
Average underwriting fees in % of gross proceeds (2007 – 2013)

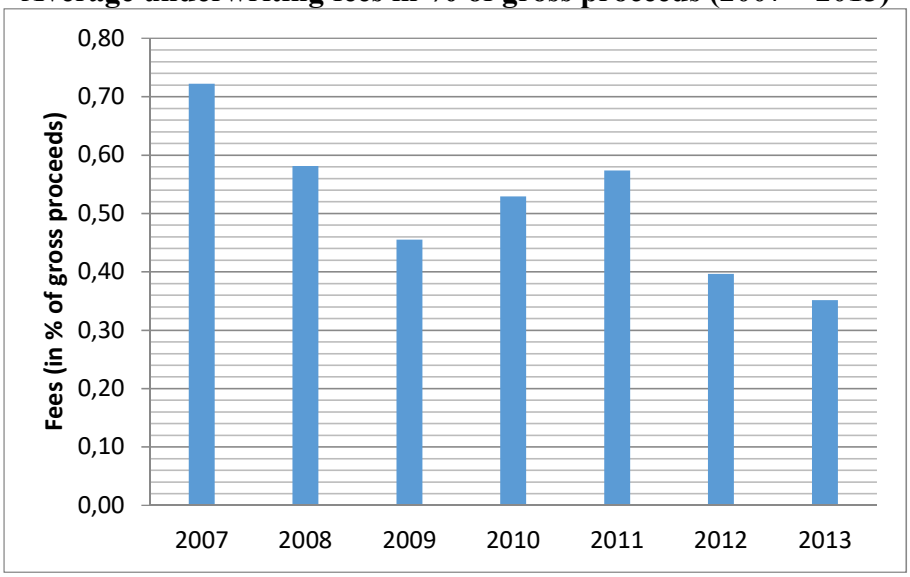


Figure 4.2.
Number of active underwriters (2003 – 2013)

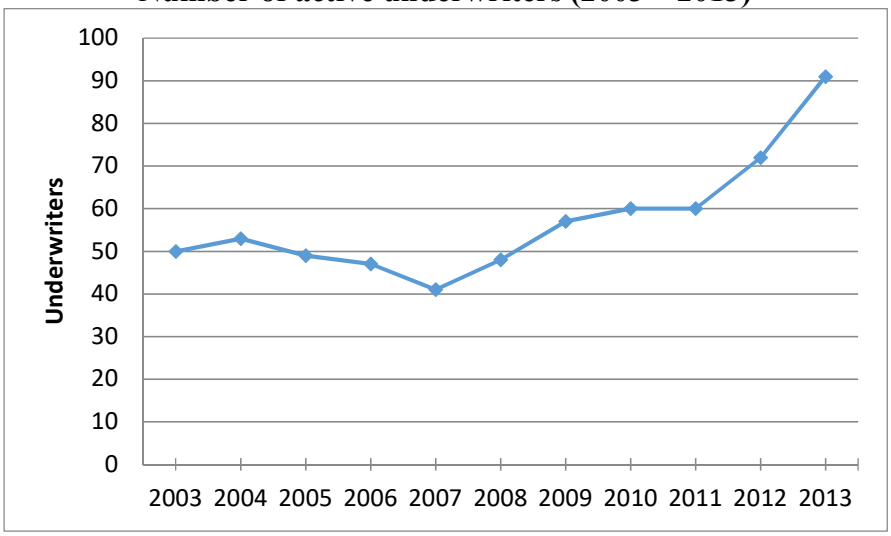
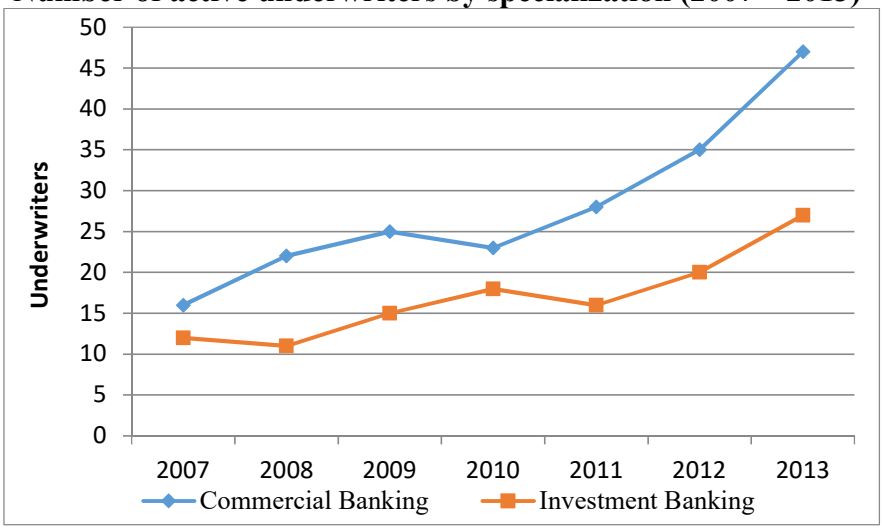


Figure 4.3.
Number of active underwriters by specialization (2007 – 2013)



Note: Classification based on the "Specialization" item reported by Bankscope. Bank Holding Companies are excluded.

Table 4.3.
Fees regressions

This table presents the coefficients of the OLS estimations for fees charged on-financial corporate bonds issued in Europe. The dependent variable is the fees in percentage of gross proceeds. Bond size is the natural logarithm of bond's proceeds. Ln (Bond Size) is the natural logarithm of bond's proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. High-Yield is a dummy variable that takes the value 1 if the Bond is a High-Yield security. Domestic is a dummy variable that takes the value 1 if the bond is placed in the domestic market of the issuer by a domestic underwriter. Negative Pledge Issuer is a variable that takes the value 1 if the bond includes a negative pledge issuer clause. Z-statistics are based on robust standard errors. A constant term is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels.

	Dep. Var: Fees (in % of gross proceeds)						
VARIABLES	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Bond Size	0.000365*	0.000267	0.000214**	0.000114	7.63e-05	-8.69e-05	-8.41e-05
	(0.000195)	(0.000172)	(0.000103)	(8.43e-05)	(8.90e-05)	(0.000125)	(0.000117)
Ln (Bond Size)	-0.342***	-0.224*	-0.281***	-0.267***	-0.243***	-0.108	-0.0666
	(0.126)	(0.123)	(0.0957)	(0.0871)	(0.0866)	(0.0878)	(0.0859)
Maturity	-0.0437	0.0257	0.0494	0.0788	0.116***	0.128***	0.130***
	(0.0804)	(0.0646)	(0.0574)	(0.0499)	(0.0363)	(0.0356)	(0.0353)
Callability	0.0331	-0.0360	-0.0760	-0.0681	-0.0282	0.0483	0.0202
	(0.120)	(0.114)	(0.0972)	(0.0899)	(0.0651)	(0.0541)	(0.0576)
High-Yield	0.738***	0.894***	0.617***	0.458***	0.367**	0.395***	0.225*
	(0.180)	(0.153)	(0.181)	(0.158)	(0.148)	(0.124)	(0.135)
Domestic	0.00740	0.380***	0.465***	0.565***	0.966***	0.895***	0.912***
	(0.317)	(0.101)	(0.0938)	(0.138)	(0.154)	(0.235)	(0.234)
Negative Pledge Issuer	0.155	0.155	-0.0369	0.0359	0.120	0.146**	0.0766
	(0.105)	(0.124)	(0.114)	(0.0934)	(0.0774)	(0.0610)	(0.0515)
Constant	1.717**	1.148	2.207***	2.070***	1.971***	1.090**	2.074***
	(0.692)	(0.765)	(0.618)	(0.502)	(0.512)	(0.518)	(0.431)
Industries Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	120	135	177	189	194	199	199
R-squared	0.600	0.466	0.396	0.322	0.443	0.417	0.528

Table 4.4.
Bond spreads regressions

This table presents the coefficients of the OLS estimations for bond spreads for non-financial corporate bonds issued in Europe. The dependent variable is bond's spreads expressed in basic points. Bond size is the natural logarithm of bond's proceeds. Ln (Bond Size) is the natural logarithm of bond's proceeds. The maturity variable is the natural logarithm of bond's time to maturity in years. Callability is a dummy for bonds with a call option. High-Yield is a dummy variable that takes the value 1 if the Bond is a High-Yield security. Domestic is a dummy variable that takes the value 1 if the bond is placed in the domestic market of the issuer by a domestic underwriter. Negative Pledge Issuer is a variable that takes the value 1 if the bond includes a negative pledge issuer clause. Z-statistics are based on robust standard errors. A constant term is included in all regressions. *, **, *** Coefficients are statistically significant different than zero at least at 10 %, 5% and 1% levels

	Dep. Var: Bond Spreads (in bps)						
VARIABLES	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Bond Size	-0.00985	0.00764	0.00772	-0.000255	-0.00738	-0.0676***	-0.0474**
	(0.0183)	(0.0269)	(0.0239)	(0.000222)	(0.0206)	(0.0184)	(0.0196)
Ln (Bond Size)	-2.088	14.49	-11.05	0.145	2.522	2.889	-11.42
	(13.30)	(17.74)	(15.84)	(0.127)	(10.92)	(7.185)	(7.597)
Maturity	32.97***	-21.73*	-42.58***	-0.356**	-14.95	11.97	10.94
	(5.424)	(12.45)	(14.52)	(0.141)	(12.45)	(9.835)	(9.269)
Callability	48.61***	57.03**	46.55	0.627***	37.62**	34.19***	13.23
	(12.35)	(24.37)	(31.69)	(0.240)	(18.91)	(13.05)	(11.60)
High-Yield	285.1***	177.4***	190.4***	2.758***	302.6***	391.8***	398.7***
	(23.46)	(38.38)	(47.22)	(0.298)	(23.80)	(19.01)	(16.84)
Domestic	9.371	-69.12**	-154.4***	-0.803***	-31.67	-10.37	-26.29
	(30.80)	(34.74)	(41.30)	(0.243)	(21.38)	(17.30)	(20.76)
Negative Pledge Issuer	-7.138	-15.04	-12.54	0.0528	14.73	2.417	-0.370
	(8.674)	(17.50)	(24.14)	(0.171)	(15.52)	(10.77)	(10.32)
Constant	-5.500	135.2	494.5***	3.687***	277.2***	206.6***	205.2***
	(84.56)	(88.83)	(103.2)	(0.812)	(63.56)	(45.11)	(50.45)
Industries Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226	245	372	515	677	806	935
R-squared	0.784	0.264	0.245	0.452	0.495	0.680	0.691

Table 4.5.
Dynamic panel estimations on underwriter market shares

This table presents the coefficients for the two-step system GMM estimation for underwriter market shares for fixed corporate bonds in Europe from 2007–2013. The dependent variable is underwriter market share computed on a proceeds base, in which proceeds of syndicated bonds are split among all the underwriters. $Mkt.share_{i,t-1}$ is the lagged dependent variable. All the explanatory variables are described in the Appendix Table A.II. Year dummies are included. P-values are calculated using Windmeijer-adjusted 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.

Dependent Variable: Mkt. Share Proceeds	(1)	(2)	(3)	(4)	(5)
$Mkt.share_{i,t-1}$	0.245**	0.272**	0.315***	0.264***	0.243**
	(0.112)	(0.116)	(0.117)	(0.0865)	(0.113)
Abnormal Bond Spreads	-5.85e-05	-4.16e-05	-0.000175	-0.000482	-0.000238
	(0.000729)	(0.000650)	(0.000520)	(0.000896)	(0.000660)
Abnormal Fees	-0.160	0.204	-0.0722	0.0736	-0.185
	(0.353)	(0.379)	(0.361)	(0.340)	(0.389)
HHI Industry Specialization	-3.73e-05		-4.08e-05		-4.28e-05
	(3.09e-05)		(2.64e-05)		(4.13e-05)
Entropy		-0.0788			
		(0.187)			
Industry Dominance				8.73e-05**	
				(3.43e-05)	
Number Star $Analyst_{i,t-1}$	0.134***	0.148***		0.119*	
	(0.0452)	(0.0483)		(0.0618)	
Star $Analyst_{i,t-1}$			0.216		
			(0.690)		
Weighted Star $Analyst_{i,t-1}$					0.0677**
					(0.0308)
UW Lender $_{i,t}$	0.336**	0.407**	0.273*	0.377***	0.288*
	(0.140)	(0.167)	(0.163)	(0.115)	(0.153)
Lending Mktshare $_{i,t}$	0.466***	0.461***	0.525***	0.408***	0.403***
	(0.130)	(0.163)	(0.131)	(0.129)	(0.149)
Private Placement	4.053**	2.061	5.390**	1.886	4.452*
	(1.905)	(2.150)	(2.669)	(2.817)	(2.611)
Multiple Uws	0.351	-0.0105	0.386	0.357	0.434
	(0.477)	(0.435)	(0.459)	(0.469)	(0.551)
Year dummies	Yes	Yes	Yes	Yes	Yes
F-test	0.000	0.000	0.000	0.000	0.000
AR(1)	0.013	0.018	0.008	0.012	0.015
AR(2)	0.289	0.225	0.438	0.285	0.266
Hansen test	0.279	0.179	0.288	0.466	0.269
Diff. In Hansen Test	0.245	0.153	0.199	0.172	0.174
Observations	823	823	823	823	823
Number of underwriters	121	121	121	121	121

Table 4.6.
Difference-in-Differences regressions on underwriter market shares

This table presents the coefficients for the difference-in-differences estimations for underwriter market shares for fixed corporate bonds in Europe from 2007–2013. The dependent variable is underwriter market share computed on a proceeds base, in which proceeds of syndicated bonds are split among all the underwriters. Column I presents the results for equation 2. Column II presents the results for equation 3. All the explanatory variables are described in the Appendix Table A.4.2. 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.

Dependent Variable: Mkt. share Proceeds Apportioned	**Equation 2**	**Equation 3 Reputable: Top 5**
Recapitalized	-0.175	
	(0.243)	
*Post-Treatment*Recapitalized (DID term)*	0.206	
	(0.173)	
Reputable Recapitalized		2.798**
		(1.242)
Not Reputable Recapitalized		-0.376
		(0.233)
*Post-Treatment*Rep. Recapitalized (DID term)*		-1.767***
		(0.651)
*Post-Treatment*Not Rep. Recapitalized (DID term)*		0.393**
		(0.166)
Abnormal Bond Spreads	-0.000309	-0.000302
	(0.000261)	(0.000268)
Abnormal Fees	0.106	-0.0719
	(0.337)	(0.335)
HHI Industry Specialization	-4.24e-05**	-4.50e-05***
	(1.64e-05)	(1.54e-05)
Number Total Star Analyst (%) $_{i,t-1}$	18.27***	16.23**
	(5.510)	(6.734)
UW Lender $_{i,t}$	0.903***	1.003***
	(0.251)	(0.242)
Lending Mktshare $_{i,t}$	0.903***	0.772***
	(0.0705)	(0.103)
UW size	-0.0530***	-0.0309
	(0.0197)	(0.0186)
ROE	0.000199	0.000254
	(0.000643)	(0.000613)
Liquidity	0.00167*	0.00171
	(0.000962)	(0.00104)
Capital Adequacy	-0.00253**	-0.00257*
	(0.00125)	(0.00134)
Operation Efficiency	0.00109	0.00137
	(0.000873)	(0.000959)
Age	-0.0288	-0.0150
	(0.0299)	(0.0300)
Listed	0.178**	0.148*
	(0.0828)	(0.0780)
Private Placement	0.934***	0.799***
	(0.331)	(0.274)
Multiple Uws	0.364**	0.386**
	(0.183)	(0.167)
Time Fixed Effects	Yes	Yes
F-test	0.000	0.000
Observations	794	794
R-squared	0.787	0.807

Table 4.7.
Robustness regressions on underwriter market shares

This table presents the coefficients for the two-step system GMM estimation for underwriter market shares for fixed corporate bonds in Europe from 2007–2013. Column I and II present the results on the data sample while Column III and IV present the results on the subsample of active underwriters placing at least one bond per year. In Column I the dependent variable is underwriter market share computed on a deal base. In Column II and IV the dependent variable is underwriter market share computing on a proceeds base, in which proceeds of syndicated bonds are given to each of them. In Column III the dependent variable is underwriter market share computed on a proceeds base, in which proceeds of syndicated bonds are split among all the underwriters. All the explanatory variables are described in the Appendix Table A.4.2. Year dummies are included. P-values are calculated using Windmeijer-adjusted 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.

Dependent Variable:			**Sub-Sample: Nº deals $_{i,t}$ >0**	
	Mkt.share deals	**Mkt.share proc. Full**	**Mkt.share proc. App**	**Mkt.share proc. Full**
Mkt.share deals $_{i,t-1}$	0.477***			
	(0.0597)			
Mkt.share proc. full $_{i,t-1}$		0.224**		0.230**
		(0.0940)		(0.102)
Mkt.share proc. app $_{i,t-1}$			0.274***	
			(0.104)	
Abnormal Bond Spreads	0.00308	-0.000226	-0.000262	-1.04e-05
	(0.00196)	(0.000652)	(0.000344)	(0.000284)
Abnormal Fees	-0.0167	-0.117	0.479	0.582
	(1.214)	(0.312)	(0.341)	(0.391)
HHI Industry Specialization	7.07e-05	-6.18e-05	7.19e-06	4.83e-06
	(6.97e-05)	(4.47e-05)	(2.20e-05)	(2.01e-05)
Number Star Analyst$_{i,t-1}$	0.269*	0.149***	0.176***	0.188***
	(0.167)	(0.0527)	(0.0595)	(0.0629)
UW Lender $_{i,t}$	2.979***	0.241*	0.437***	0.443***
	(0.664)	(0.170)	(0.143)	(0.162)
Lending Mktshare $_{i,t}$	2.026***	0.449***	0.627***	0.676***
	(0.571)	(0.160)	(0.129)	(0.153)
Private Placement	10.44	4.755*	0.239	0.291
	(8.573)	(2.605)	(0.252)	(0.241)
Multiple Uws	-2.661**	0.610	0.401	0.437*
	(1.032)	(0.552)	(0.243)	(0.257)
Year dummies	Yes	Yes	Yes	Yes
F-test	0.000	0.000	0.000	0.000
AR(1)	0.000	0.012	0.016	0.018
AR(2)	0.328	0.163	0.241	0.148
Hansen test	0.118	0.357	0.154	0.241
Diff. In Hansen Test	0.181	0.751	0.157	0.369
Observations	823	823	421	421
Number of underwriters	121	121	121	121

Table 4.8.
Robustness checks in Difference-in-Differences regressions on underwriter market shares

This table presents the coefficients for the difference-in-differences estimations for underwriter market shares for fixed corporate bonds in Europe from 2007–2013. Column I and II present the results for equation 2. Column III - VI present the results for equation 3. Column I, III, IV and VI present the results on the data sample while Column II and V present the results on the subsample of active underwriters placing at least one bond per year All the explanatory variables are described in the Appendix Table A.4.2. 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.

	Equation 2		Equation 3			
	Dep. Var:	Subsample Nº deals >0	Dep. Var:		Dep. Var:	Subsample Nº deals >0
	Mkt. share proceeds full	Mkt. share Proceeds Apportioned	Mkt. share Proceeds Apportioned		Mkt. share proceeds full	Mkt. share Proceeds Apportioned
Dependent Variable:			Reputable Top 3	Reputable Top 15		
Recapitalized	-0.170	-0.405				
	(0.234)	(0.526)				
*Post-Treatment*Recapitalized (DID term)*	0.214	0.436				
	(0.180)	(0.394)				
Reputable Recapitalized			3.742***	0.854	2.958**	2.415*
			(1.376)	(0.811)	(1.182)	(1.304)
Not Reputable Recapitalized			-0.300	-0.423***	-0.380*	-0.864*
			(0.255)	(0.158)	(0.226)	(0.513)
*Post-Treatment*Rep. Recapitalized (DID term)*			-2.140**	-0.0991	-1.840***	-1.412**
			(0.919)	(0.484)	(0.701)	(0.684)
*Post-Treatment*Not Rep. Recapitalized (DID term)*			0.362**	0.235**	0.408**	0.862**
			(0.191)	(0.107)	(0.175)	(0.395)
Abnormal Bond Spreads	-0.000228	-0.000740*	-0.000366	-0.000102	-0.000221	-0.000814*
	(0.000216)	(0.000417)	(0.000278)	(0.000225)	(0.000217)	(0.000412)
Abnormal Fees	0.0118	-0.281	-0.0528	0.151	-0.176	-0.577
	(0.333)	(0.410)	(0.342)	(0.316)	(0.331)	(0.436)
HHI Industry Specialization	-4.45e-05***	-5.07e-05*	-5.04e-05***	-4.04e-05***	-4.73e-05***	-6.30e-05**
	(1.69e-05)	(2.65e-05)	(1.67e-05)	(1.53e-05)	(1.59e-05)	(2.56e-05)
Number Total Star Analyst (%) $_{i,t-1}$	15.77***	16.94***	14.35***	17.05***	13.63**	14.98**
	(4.646)	(5.384)	(5.107)	(6.427)	(5.952)	(6.470)
UW Lender $_{i,t}$	0.837***	0.778***	0.934***	0.909***	0.943***	0.854***
	(0.249)	(0.248)	(0.250)	(0.241)	(0.244)	(0.239)
Lending Mktshare $_{i,t}$	1.005***	0.929***	0.820***	0.779***	0.866***	0.790***
	(0.0672)	(0.0717)	(0.0841)	(0.104)	(0.0946)	(0.110)
UW size	-0.0669***	-0.00283	-0.0375*	-0.0311*	-0.0436**	0.0366
	(0.0186)	(0.0560)	(0.0208)	(0.0178)	(0.0177)	(0.0631)
ROE	-0.000150	0.000430	0.000460	-0.000104	-9.49e-05	0.000699
	(0.000602)	(0.000693)	(0.000693)	(0.000491)	(0.000567)	(0.000713)
Liquidity	0.00127*	0.00259*	0.00180*	0.00116	0.00131*	0.00270*
	(0.000696)	(0.00134)	(0.00100)	(0.000708)	(0.000779)	(0.00151)
Capital Adequacy	-0.00211**	-0.00526	-0.00254*	-0.00220*	-0.00216*	-0.0130
	(0.00104)	(0.0331)	(0.00133)	(0.00113)	(0.00111)	(0.0332)
Operation Efficiency	0.000713	0.00379*	0.00147	0.00133	0.00101	0.00434*
	(0.000683)	(0.00217)	(0.000971)	(0.000831)	(0.000771)	(0.00227)

Table 4.8. (cont.)

	Equation 2 Dep. Var:	Subsample Nº deals >0	Equation 3 Dep. Var:		Subsample Nº deals >0	
Dependent Variable:	**Mkt. share proceeds full**	**Mkt. share Proceeds Apportioned**	**Mkt. share Proceeds Apportioned Reputable Top 3**	**Reputable Top 15**	**Mkt. share proceeds full**	**Mkt. share Proceeds Apportioned**
Age	-0.0387	-0.0679	-0.0117	-0.0252	-0.0241	-0.0735
	(0.0303)	(0.0559)	(0.0311)	(0.0265)	(0.0294)	(0.0559)
Listed	0.172**	0.286*	0.183**	0.127*	0.140*	0.229
	(0.0793)	(0.156)	(0.0834)	(0.0722)	(0.0728)	(0.152)
Private Placement	0.780***	1.314**	0.968***	0.839***	0.638**	1.068**
	(0.293)	(0.555)	(0.322)	(0.298)	(0.244)	(0.492)
Multiple Uws	0.390**	0.278	0.441**	0.355**	0.414**	0.149
	(0.187)	(0.308)	(0.185)	(0.165)	(0.170)	(0.279)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
F-test	0.000	0.000	0.000	0.000	0.000	0.000
Observations	794	425	794	794	794	425
R-squared	0.797	0.761	0.805	0.796	0.820	0.786

Appendix A.4

Table A.4.1.
National ranking league tables by market share (<1% Market share)

Underwriter	France	Germany	United Kingdom	Italy	Spain	Europe
Mitsubishi UFJ Financial Group	2.1024	0.2166	1.3119	0.3456	0.4112	0.9467
RBC Capital Markets	0.8896	1.3463	1.1737	0.0000	0.0000	0.8117
Mizuho	0.6067	0.5094	1.5551	0.0920	0.0000	0.6872
LBBW	0.0000	2.7201	0.0000	0.0000	0.0000	0.6038
SEB	0.0000	0.3290	0.0000	0.0000	0.0000	0.5681
Nordea Markets	0.0000	0.1655	0.1047	0.0000	0.0000	0.5363
BayernLB	0.1319	2.1514	0.0000	0.0000	0.0000	0.5071
Danske Bank	0.0000	0.6159	0.0647	0.0000	0.0000	0.4723
Merrill Lynch	0.5308	0.1725	0.2745	0.2943	0.0000	0.4213
DZ Bank	0.0000	1.4491	0.0000	0.0000	0.0000	0.3761
TD Securities Inc	0.4086	0.6763	0.2060	0.0000	0.0000	0.3447
KBC	0.0616	0.0031	0.0336	0.0000	0.0000	0.3440
ABN AMRO	0.5929	0.0752	0.2039	0.3370	0.0000	0.3425
Erste Group Bank AG	0.0000	0.0701	0.0000	0.0000	0.0000	0.3302
Raiffeisen Bank International AG	0.0000	0.1882	0.0000	0.0000	0.0000	0.3220
Mediobanca	0.1639	0.1093	0.0000	3.4205	0.0000	0.3048
Lehman Brothers	0.0000	0.0000	0.9430	0.0000	0.0000	0.2437
Bank of America	0.0000	0.1000	0.5177	0.0000	1.1915	0.2335
Standard Chartered Bank	0.0382	0.1756	0.6528	0.0000	0.0000	0.2132
Rabobank	0.0535	0.0464	0.0000	0.0522	0.0000	0.1994
CaixaBank	0.0000	0.0000	0.0000	0.0000	3.3595	0.1511
Nomura	0.0431	0.1624	0.1177	0.2199	0.2915	0.1459
Svenska Handelsbanken AB	0.0000	0.0433	0.0000	0.0000	0.0000	0.1412
Belfius Bank & Insurance	0.0000	0.0000	0.0000	0.0000	0.0000	0.1367
Fortis	0.0000	0.0000	0.0000	0.0000	0.0000	0.1316
OP-Pohjola Group	0.0000	0.0000	0.0000	0.0000	0.0000	0.1231
CM-CIC	0.5484	0.0000	0.0000	0.0000	0.0000	0.1228
Dresdner Kleinwort	0.3122	0.2255	0.0000	0.0000	0.0000	0.1200
Caja Madrid - Bankia	0.0000	0.0000	0.0000	0.0000	3.4035	0.1136
Sumitomo Mitsui Financial Group	0.2888	0.1481	0.0000	0.0000	0.0000	0.1115
Close Brothers Group plc	0.0000	0.4713	0.0000	0.0000	0.0000	0.1090
KKR	0.0822	0.0922	0.0312	0.0000	0.2915	0.1021
WestLB	0.0000	0.4158	0.0000	0.0000	0.0000	0.0979
CaixaBI	0.0000	0.0000	0.0000	0.0000	0.3986	0.0856
Wells Fargo Securities	0.0000	0.0338	0.3041	0.0000	0.0000	0.0847
Monte dei Paschi	0.0000	0.0000	0.0000	1.4594	0.0000	0.0805
Jefferies LLC	0.0000	0.2075	0.0000	0.0000	0.0000	0.0777
Helaba	0.0000	0.3095	0.0000	0.0000	0.0000	0.0687
Pareto Securities	0.0000	0.0000	0.1490	0.0000	0.0000	0.0687
ANZ	0.0199	0.0367	0.1831	0.0000	0.0000	0.0591
Swedbank	0.0000	0.0000	0.0000	0.0000	0.0000	0.0487
Centrobanca SpA	0.0000	0.0000	0.0000	0.8555	0.0000	0.0472
Banco Espirito Santo	0.0000	0.0000	0.0000	0.0000	0.3986	0.0442
Canaccord Genuity Corp	0.0000	0.0000	0.1602	0.0000	0.0000	0.0407
Daiwa Securities	0.1351	0.0062	0.0000	0.0000	0.0000	0.0316
Commonwealth Bank of Australia	0.0265	0.0000	0.0983	0.0000	0.0000	0.0309
Dexia	0.0995	0.0000	0.0000	0.0000	0.0000	0.0281
Scotiabank	0.0000	0.0000	0.0554	0.0000	0.0000	0.0280
National Australia Bank	0.0000	0.0063	0.0926	0.0000	0.0000	0.0249
Millennium Investment Banking	0.0000	0.0000	0.0000	0.0000	0.0000	0.0239
Banco BPI	0.0000	0.0000	0.0000	0.0000	0.0000	0.0232
DNB Markets	0.0000	0.0000	0.0000	0.0000	0.0000	0.0227
CIBC World Markets	0.0194	0.0270	0.0477	0.0000	0.0000	0.0224
Oddo & Cie	0.0996	0.0000	0.0000	0.0000	0.0000	0.0223
Banca March SA	0.0000	0.0000	0.0000	0.0000	0.7833	0.0217
TradeRisks Ltd	0.0000	0.0000	0.0805	0.0000	0.0000	0.0204
Banca Akros	0.0000	0.0000	0.0000	0.3689	0.0000	0.0203
IKB Deutsche Industriebank	0.0000	0.0459	0.0000	0.1690	0.0000	0.0195

Table A.4.1 (cont.)

Underwriter	France	Germany	United Kingdom	Italy	Spain	Europe
BAWAG	0.0000	0.0000	0.0000	0.0000	0.0000	0.0190
Alpha Bank AE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0183
Eurobank Ergasias SA	0.0000	0.0000	0.0000	0.0000	0.0000	0.0183
Industrial & Com. Bank of China- ICBC	0.0606	0.0000	0.0162	0.0000	0.0000	0.0177
Bank of China	0.0382	0.0218	0.0162	0.0000	0.0000	0.0175
Macquarie Group	0.0000	0.0000	0.0579	0.0000	0.0000	0.0147
BMO Capital Markets	0.0000	0.0031	0.0000	0.0000	0.0000	0.0146
DBS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0140
Raiffeisenlandesbank Oberoesterreich	0.0000	0.0000	0.0000	0.0000	0.0000	0.0122
National Bank of Greece	0.0000	0.0000	0.0000	0.0000	0.0000	0.0110
Quirin Bank AG	0.0000	0.0486	0.0000	0.0000	0.0000	0.0108
Petercam	0.0000	0.0000	0.0000	0.0000	0.0000	0.0108
Steubing AG	0.0000	0.0202	0.0000	0.0000	0.0000	0.0101
Investec Bank	0.0000	0.0000	0.0375	0.0000	0.0000	0.0095
Westpac	0.0000	0.0425	0.0000	0.0000	0.0000	0.0094
APG Algemene Pensioen Groep NV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0083
Itau BBA	0.0000	0.0000	0.0000	0.0000	0.2766	0.0077
Cecabank SA	0.0000	0.0000	0.0000	0.0000	0.2677	0.0074
Banco de Sabadell SA	0.0000	0.0000	0.0000	0.0000	0.2559	0.0071
Astrup Fearnley AS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0068
GMP Capital Inc	0.0000	0.0000	0.0248	0.0000	0.0000	0.0063
Nova Ljubljanska Banka	0.0000	0.0000	0.0000	0.0000	0.0000	0.0059
Banco Popular Espanol SA	0.0000	0.0000	0.0000	0.0000	0.2025	0.0056
Banco Espirito Santo de Investimento	0.0000	0.0000	0.0000	0.0000	0.0000	0.0054
China Construction Bank Corp - CCB	0.0000	0.0201	0.0000	0.0000	0.0000	0.0045
Zuercher Kantonalbank - ZKB	0.0000	0.0193	0.0000	0.0000	0.0000	0.0043
Renta 4	0.0000	0.0000	0.0000	0.0000	0.1330	0.0037
MM Warburg	0.0000	0.0165	0.0000	0.0000	0.0000	0.0037
Bankinter	0.0000	0.0000	0.0000	0.0000	0.1288	0.0036
Abanka Vipa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0033
Vontobel	0.0000	0.0125	0.0000	0.0000	0.0000	0.0028
Privatbanka as	0.0000	0.0000	0.0000	0.0000	0.0000	0.0025
Ahorro Corporacion Financiera SA	0.0000	0.0000	0.0000	0.0000	0.0871	0.0024
Banco Caminos SA	0.0000	0.0000	0.0000	0.0000	0.0871	0.0024
Banco Grupo Cajatres SA	0.0000	0.0000	0.0000	0.0000	0.0871	0.0024
Sociedad General de Valores y Cambios	0.0000	0.0000	0.0000	0.0000	0.0871	0.0024
Privredna Banka Zagreb	0.0000	0.0000	0.0000	0.0000	0.0000	0.0016
National Bank Financial	0.0000	0.0031	0.0000	0.0000	0.0000	0.0007
EuroLand Finance SA	0.0028	0.0000	0.0000	0.0000	0.0000	0.0006
Parex Banka	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003
$H_0 : \mu_{country} = \mu_{Europe}$ t-values:	**-2.30**	**0.5511**	**-1.64**	**-1.03**	**-1.0310**	
Herfindahl-Hirschman Index	**686.628**	**622.920**	**639.836**	**702.265**	**558.544**	**477.218**
Syndicate size	**3.506**	**3.214**	**3.156**	**4.390**	**4.508**	**3.185**
Domestic Bonds (%)	**2.64%**	**1.84%**	**0.38%**	**7.14%**	**5.44%**	**3.66%**
Domestic Underwriters	**7**	**11**	**7**	**6**	**14**	**-**
U.S Underwriters	**8**	**12**	**11**	**6**	**7**	**13**

Table A.4.2.
Description of the variables

Variable	Description
Mkt. share / Mkt.share proc. App.	Market share computed on annual proceeds raised in the corporate bond markets (in case of more underwriters all the proceeds are equally split among all the underwriters).
Mkt.share deals	Market share computed on annual deals placed in the corporate bond markets.
Mkt.share proc. full	Market share computed on annual proceeds raised in the corporate bond markets (in case of more underwriters all the proceeds are given each of them).
Abnormal bond spreads	Weighted bond spreads in a three –year window. $Spread\ (in\ bps) = \alpha + \beta_1 Proceeds + \beta_2 ln(Proceeds) + \beta_3 \ln(Maturity) + \beta_4 Callable\ Bond + \beta_5 High - Yield\ Bond + \beta_6 Domestic\ Bond + \beta_7 Neg.Pledge\ Issuer + Industries\ Dummies + Countries\ Dummies + e_i$ $Abnormal\ bond\ spread = Spread - \widehat{Spread}$ Abnormal fees are the weighted underwriting fees charged in a three –year window.
Abnormal fees	Weighted underwriting fees charged in a three –year window. $Fees\ (in\ \%\ of\ gross\ proceeds) = \alpha + \beta_1 Proceeds + \beta_2 ln(Proceeds) + \beta_3 \ln(Maturity) + \beta_4 Callable\ Bond + \beta_5 High - Yield\ Bond + \beta_6 Domestic + \beta_7 Neg.Pledge\ Issuer + Industries\ Dummies + Countries\ Dummies + e_i$ $Abnormal\ fees = fees - \widehat{fees}$
Industry Specialization	Herfindhal index calculated for each underwriter as $\sum_{j=1}^{n}\left(\frac{g_{ij}}{G_i}\right)^2$ (g_{ij} is the gross proceeds issued by the underwriter "i" in the two-digit SIC-industry "j" and G_i is the total gross proceeds issued by the underwriter "i").
Industry Dominance	Herfindhal index calculated for each underwriter as $\sum_{j=1}^{n}\left(\frac{g_{ij}}{G_j}\right)^2$ (g_{ij} is the gross proceeds issued by the underwriter "i" in the two-digit SIC-industry "j" and G is the total gross proceeds issued in industry "j").
Entropy Measure of Diversification	Index calculated for each underwriter as $\sum_{j=1}^{n}\left(\frac{g_{ij}}{G_i}\right) \ln\left(\frac{G_i}{g_{ij}}\right)$ (g_{ij} is the gross proceeds issued by the underwriter "i" in the two-digit SIC-industry "j" and G_i is the total gross proceeds issued by the underwriter "i").
Star analyst	Dummy that equals one if there is at least one reported in the All-Fixed Income Research Rankings by Institutional Investor's
Number Star Analyst	Number of analysts reported by Institutional Investor for each underwriter in the All-Fixed Income Research Rankings.
Weighted Star Analyst	Weighted Number of analysts reported by Institutional Investor for each underwriter in the All-Fixed Income Research Rankings adding 4 points if the analyst is placed first, 3 points if the analyst is placed second, 2 points if the analyst is placed third and 1 if it is considered runner-up.
UW Lender	Dummy that takes the value 1 if the underwriter bank has taken also the role of lead manager in a loan issued by a firm in the same natural year.

Table A.4.2. (cont.)

Variable	Description
UW Size	Natural Logarithm of the total assets of the underwriter computed at the beginning of "t" period
ROE	Ratio of Net Income to Total Assets computed at the beginning of "t" period
Liquidity	Ratio of liquid Assets to Total Customer Deposits and Short Term Debt computed at the beginning of "t" period
Capital Adequacy	Ratio of capital Funds to total assets at the beginning of "t" period
Operations Efficiency	Cost to income ratio computed at the beginning of "t" period
Age	Natural Logarithm of the years since the first issuance of the Underwriter or previous Underwriter since 1988
Listed	Dummy that takes the value 1 if the underwriter bank is listed in a stock exchange market.
Lending market share	Computed on annual proceeds lent for each sample underwriter as lead manager in the European syndicate loan market (in case of more than one lender banks all the proceeds are equally split among all the lenders
Weighted Private Placement	Average ratio of Proceeds placed on private placement deals over total proceeds placed in a three –year window (t, t-1, t-2)
Weighted Multiple UW Deals	Average ratio of Proceeds placed on multiple underwritten deals over total proceeds placed in a three –year window (t, t-1, t-2)
Recapitalization	Dummy that takes the value 1 if the underwriter bank has been being recipient of a state capital injection.
Post-Treatment t	Dummy that takes the value 1 from September 2008 to December 2013, while it takes the value 0 from January 2006 to September 2008.
Reputable	Dummy that takes the value 1 if the underwriter if the underwriter bank is ranked in the top five in the annual league tables.
Reputable Top 3	Dummy that takes the value 1 if the underwriter if the underwriter bank is ranked in the top three in the annual league tables.
Reputable Top 15	Dummy that takes the value 1 if the underwriter if the underwriter bank is ranked in the top fifteen in the annual league tables.

Appendix B.4

Table B.4.1.
Recapitalization measures received by underwriters (2006 – 2013)

	State AID	Date	Amount	Source	Notes
Abanka Vipa	Slovenia	Dec. 2013	EUR 0.348 bn.	European Commission	Abanka received a capital injection in the form of equity capital paid in cash. The maximum amount of the capital injection was EUR 348 million which represented the 16.6% of the total risk weighted assets ("RWA") of the Bank.
ABN AMRO	Netherlands	July. 2009	EUR 0.5 bn.	European Commission	The European Commission considered that the Dutch State aid to finance separation costs was a recapitalization measure of EUR 500 million. Although the whole measure accounts EUR 1.08 billion, the prudential margin of EUR 500 million provided ABN AMRO with extra capital and represented a selective advantage.
	Netherlands	July. 2009	EUR 0.3 bn.	European Commission	Recapitalization to cover capital shortage related to divestment of New HBU.
	Netherlands	Jan. 2010	EUR 1.2 bn.	European Commission	Recapitalization to cover integration costs.
Alpha Bank	Greece	May. 2009	EUR 0.94 bn.	European Commission	In May 2009, the Alpha Bank received a capital injection under the Recapitalization measure of the Greek Bank Support Scheme. That capital injection was equivalent to around 2% of the risk weighted assets ("RWA") of the Bank at that time. The Recapitalization took the form of preference shares subscribed by Greece which had a coupon of 10% and a maturity of five years.
	Greece	May. 2012	EUR 1.9 bn.	European Commission	In May 2012, the HFSF transferred EUR 1.9 billion, in line with the provisions for bridge Recapitalizations laid down in the law 3864/2010 establishing the HFSF.
	Greece	Dec. 2012	EUR 1.04 bn.	European Commission	On 21 December 2012, the HFSF implemented a second bridge Recapitalization of EUR 1,042 million.
	Greece	June. 2013	EUR 4.04 bn.	European Commission	On 3 June 2013, Alpha Bank announced that the HFSF would subscribe 9 138 636 364 shares at a price of EUR 0,44 per share. As a result, the HFSF injected into the Bank capital totaling EUR 4,021 million in the form of ordinary shares.
Banc of America	U.S	Oct. 2008	USD 15 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
	U.S	Jan. 2009	USD 10 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
	U.S	Jan. 2009	USD 20 bn.	U.S Dep.of Treasury	TPI (Targeted Investment Program)
Banco BPI	Portugal	June. 2012	EUR 1.5 bn.	European Commission	Recapitalization under the Recapitalization Scheme for credit institutions in the form of contingent convertible subordinated bonds ("CoCos") amounting to EUR 1.5 billion (the amount being equal to 6% of RWA), with an interest rate that started at 8.5% gradually increases up to 10% RWA over the restructuring period.
Banco Grupo Cajatres	Spain	Dec. 2012	EUR 0.407 bn.	European Commission	The Fondo de Reestructuración Ordenada Bancaria (FROB), on the basis of the Restructuring Plan, injected EUR 407 million in the form of convertible contingent bonds ("CoCos").The CoCos are considered instruments eligible as Core Tier 1 capital for solvency purposes, with an investment period by the FROB of five years.
Bankia	Spain	June. 2010	EUR 4.47 bn.	European Commission	Bankia-BFA benefited from a capital injection in 2010 of EUR 4,465 million in the form of convertible preference shares purchased by the FROB. The aid represented [0-5] % of the BFA Group's RWA as of March 2010. The securities subscribed for by the FROB had an annual yield of 7.75% the first year. On 14 May 2012, the Bank of Spain considered improbable the redemption of the convertible preference shares, so the FROB decided to convert its preference shares in BFA into ordinary shares.

Table B.4.1. (cont.)

	State AID	Date	Amount	Source	Notes
	Spain	Sept. 2012	EUR 4.5 bn.	European Commission	On 4 September 2012, the BFA Group benefited from an urgent Recapitalization measure via a new capital injection of EUR 4.5 billion in the form of ordinary shares into BFA.
	Spain	Dec. 2012	EUR 13.5 bn.	European Commission	The FROB subscribed EUR 13.5 billion in ordinary shares in BFA and then BFA transferred the funds injected into it by the FROB to Bankia through the subscription of contingency convertible bonds ("CoCos") qualifying as capital principal (or CT1 EBA)
BAWAG	Austria	Dec. 2009	EUR 0.55 bn.	European Commission	BAWAG issued participation capital totaling EUR 550 and subscribed by the State of Austria on 23 December 2009. The amount of the capital injection corresponded to approximately 2.4% of risk weighted assets (RWA). Participation capital is a form of own funds of credit institutions defined by the Austrian Banking Act as Tier 1 capital.
BayernLB	Germany	Dec. 2008	EUR 10 bn.	European Commission	On December 2008, BayernLB received a capital injection from the State of Baviera of EUR 10 billion. The capital injection consisted in a Tier 1 capital injection. Furthermore, simultaneously the State of Baviera provided a risk shield of EUR 4.8 billion.
BNP Paribas	France	Dec. 2008	EUR 2.55 bn.	European Commission	The French Capital-injection scheme for banks set up the Société de Prise de Participation de l'État wiht the aim of participating in operations to inject capital into sound financial institutions, or to rescue operations for financial institutions in difficulty. Under this scheme, BNP Paribas received a capital injection from the SPPE which subscribed subordinated debt securities (TSS), qualifyed as Tier 1 Capital.
Credit Agricole	France	Dec. 2008	EUR 3.0 bn.	European Commission	The French Capital-injection scheme for banks set up the Société de Prise de Participation de l'État wiht the aim of participating in operations to inject capital into sound financial institutions, or to rescue operations for financial institutions in difficulty. Under this scheme, Credit Agricole received a capital injection from the SPPE which subscribed subordinated debt securities (TSS), qualifyed as Tier 1 Capital.
Citigroup	U.S	Oct. 2008	USD 25 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
	U.S	Dec. 2008	USD 20 bn.	U.S Dep.of Treasury	TPI (Targeted Investment Program)
Credit Mutuel	France	Dec. 2008	EUR 1.2 bn.	European Commission	The French Capital-injection scheme for banks set up the Société de Prise de Participation de l'État wiht the aim of participating in operations to inject capital into sound financial institutions, or to rescue operations for financial institutions in difficulty. Under this scheme, Credit Mutuel received a capital injection from the SPPE which subscribed subordinated debt securities (TSS), qualifyed as Tier 1 Capital.
Commerzbank	Germany	Dec. 2008	EUR 8.2 bn.	European Commission	The SoFFin I (Sonderfonds Finanzmarktstabilisierung) undertook a measure in the form of a silent participation amounting to EUR 8.2 billion which was made available on 31 December 2008. The agreement on the silent participation provides for a fixed interest rate of 9% per annum on the whole amount. In addition, a variable rate of interest is provided for, based on the sum of the distributed dividends.
	Germany	January. 2009	EUR 1.8 bn.	European Commission	Under an agreement dated 9 January 2009 between Commerzbank, Allianz and SoFFin, SoFFin is to make available to Commerzbank additional equity capital totaling EUR 1.8 billion. This SoFFin II measure consisted in a capital increase of 25% plus one share against payment.
	Germany	January. 2009	EUR 8.2 bn.	European Commission	The SoFFin II (Sonderfonds Finanzmarktstabilisierung) undertook a measure in the form of a silent participation amounting to EUR 8.2 billion on January 2009. The agreement on the silent participation was provided on the same terms as the first silent participation.
Dexia	Belgium, France and Luxembourg	Oct. 2008	EUR 5.2 bn.	European Commission	Belgium (EUR 3 billions), France (EUR 3 billions) and Luxembourg (376 EUR mill.) granted rescue state aid that consisted of a capital injection of EUR 6.37 billion, of which the European Commission regards EUR 5.2 billion as state aid.

Table B.4.1. (cont.)

	State AID	Date	Amount	Source	Notes
	Belgium and France	Dec. 2012	EUR 5.5 bn.	European Commission	On December 2012, Belgium and France engaged in a capital subscription of EUR 5.5 billion in preference shares without voting rights. Belgium subscribed the 53% of the capital increase (EUR 2.9 billion) and France the 47% (EUR 2.6 billions).
Erste Group Bank	Austria	March. 2009	EUR 1 bn.	Finance Ministry of Austria	On March 2009, Erste received EUR 1 billion in the form of participation capital (hybrid capital). This participation capital paid an 8% dividend. Participation capital is a form of own funds of credit institutions defined by the Austrian Banking Act as Tier 1 capital.
Eurobank Ergasias	Greece	May. 2009	EUR 0.95 bn.	European Commission	On May 2009, the bank received a capital injection of EUR 950 million under the Recapitalization measure of the Greek Banks Support scheme. That capital injection was equivalent to around 2% of the RWA the Bank had at that time. The Recapitalization took the form of preference shares subscribed by Greece which had a coupon of 10% and a maturity of five years.
	Greece	May. 2012	EUR 3.97 bn.	European Commission	On May 2012, the HFSF transferred EUR 3.97 billion of EFSF bonds to the Bank
	Greece	Dec. 2012	EUR 1.34 bn.	European Commission	On 21 December 2012, the HFSF implemented a second bridge Recapitalization of EUR 1,341 million, which was paid again by transferring EFSF bonds to the Bank.
	Greece	May. 2013	EUR 5.84 bn.	European Commission	On 30 April 2013, the general meeting of shareholders approved an increase in the share capital of the Bank for an amount of EUR 5,839 million been provided by the HFSF in the form of in the form of ordinary shares
Fortis	Belgium and Luxembourg	Sept. 2008	EUR 7.2 bn.	European Commission	Belgium through the intermediary of Société Fédérale de Participation et d'Investissement (SFPI) subscribed to a capital increase in Fortis Bank of EUR 4.7 billion and Luxembourg Government granted Fortis Bank Luxembourg a three-year convertible loan of EUR 2.5 billion.
	Netherlands	Dec. 2008	EUR [0-2.75] bn - EUR [0.95-3.65] bn	European Commission	On 24 December 2008, the Dutch State acquired ABN AMRO N from FBN for EUR 6,5 billion. The European Commission concluded that the purchase of ABN AMRO N by the Dutch State did not take place at market conditions. Therefore, it concluded that this measure was a State aid measure in favor of FBN as it provided FBN with capital enabling it to remain on the market. The identified amount of aid is situated in a range between EUR [0-2,75] billion and EUR [0,95-3,65] billion.
	Netherlands	Feb. 2010	EUR 1.35 bn.	European Commission	The Dutch State converted Tier 2 debt instruments with a nominal value of EUR 1.35 billion into an equivalent amount of Tier 1 capital
Goldman Sachs	U.S	Oct. 2008	USD 10 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
IKB Deutsche Industriebank	Germany	Feb. 2008	EUR 2.3 bn.	European Commission	In February 2008, The German federal government instructed Kreditanstalt für Wiederaufbau (Kfw, a government-owned bank) to provide a third, EUR 2.3 billion support measure for IKB. The KfW granted EUR 1.05 billion as a non-redeemable loan. The measure was approved by the Commission under State aid rules in the form of a restructuring decision.
ING	Netherlands	Nov.2008	EUR 10 bn.	European Commission	On 12 November 2008, the European Commission authorized a EUR 10 billion capital increase in ING Groep N.V. ("ING") in the form of Core Tier 1 securities ("CT1 securities").
JPMorgan	U.S	Oct. 2008	USD 25 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
KBC	Belgium	Dec. 2008	EUR 3.5 bn.	European Commission	On 18 December 20082, the European Commission approved the EUR 3.5 billion Recapitalization of KBC provided by the Belgian Federal government. This Recapitalization took the form of an injection of EUR 3.5 billion in total of core Tier-1 capital through Yield enhanced securities issued by KBC and fully subscribed by the Belgian authorities. The issue price was EUR 29.50 per security.
	Belgium	Jan. 2009	EUR 3.5 bn.	European Commission	On 22 January 2009, Belgium and KBC announced a further strengthening of KBC's capital base. The second Recapitalization took the form of a EUR 3.5 billion capital injection of core Tier-1 capital by the Belgian authorities in the form of securities. The terms of the agreement were practically identical to the first Recapitalization.

Table B.4.1. (cont.)

	State AID	Date	Amount	Source	Notes
LBBW	Germany	June. 2009	EUR 5 bn.	European Commission	LBBW's public entities owners (Land Baden-Württemberg, the Savings banks association of Baden-Württemberg, the city of Stuttgart and the Landeskreditbank Baden-Württemberg) injected EUR 5 billion of tier 1 capital (Kernkapital) in the form of a new class B of ordinary shares. The capital injection amounted to about 2.8% of the bank's risk weighted assets (RWAs) when using the audited end-2008 figures.
Lloyds Banking Group	United Kingdom	Jan. 2009	GBP 17 bn.	European Commission	In January 2009, Lloyds received a State Recapitalization with GBP 13 billion in ordinary shares and GBP 4 billion in preference shares. As a result, the UK government ended up having an equity ownership of 43.5%.
Millennium Investment Banking	Portugal	June. 2012	EUR 3 bn.	European Commission	On 29 June 2012, Banco Comercial Português, S.A. issued EUR 3 billion of hybrid capital instruments convertible into shares ("CoCos") which are subscribed by the Portuguese State (under the Portuguese Recapitalization Scheme). These instruments are eligible for treatment as Core Tier 1 capital.
Monte dei Paschi	Italy	Dec. 2009	EUR 1.9 bn.	European Commission	In 2009, MPS issued EUR 1.9 billion of hybrid capital instruments subscribed by Italy. This measure was taken under the first Italian Recapitalization scheme approved by the Commission on 23 December 2008. These instruments were hybrid capital that counted as Core Tier 1 capital and had a fixed remuneration in case of profit.
	Italy	Dec. 2012	EUR 2 bn.	European Commission	On December 2012, the European Commission approved an issuance of the hybrid capital instruments which are eligible as regulatory CT1 for an overall maximum amount of EUR 3.9 billion, which Italy intends to subscribe. That amount includes a replacement of the outstanding instruments of EUR 1.9 billion. This increased its common equity tier 1 capital ratio to 9%
Morgan Stanley	U.S	Oct. 2008	USD 10 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
National Bank of Greece	Greece	May. 2009	EUR 0.35 bn.	European Commission	In May 2009, the National Bank of Greece received from Greek Banks Support Scheme a capital injection of EUR 350 million. The Recapitalization took the form of preference shares subscribed by Greece which had a coupon of 10% and a maturity of five years
	Greece	Dec. 2011	EUR 1 bn.	European Commission	In December 2011, the National Bank of Greece received from Greek Banks Support Scheme a capital injection of EUR 1,000 million respectively. The Recapitalization took the form of preference shares subscribed by Greece which had a coupon of 10% and a maturity of five years
	Greece	May. 2012	EUR 7.4 bn.	European Commission	On 28 May 2012, the HFSF transferred EUR 7.4 billion of EFSF bonds to the Bank, in line with the provisions for bridge Recapitalizations laid down in the law 3864/2010 establishing the HFSF
	Greece	Dec. 2012	EUR 2.3 bn.	European Commission	On 21 December 2012, the HFSF implemented a second bridge Recapitalization of EUR 2 326 million, which was paid by transferring EFSF bonds to the Bank.
	Greece	May. 2013	EUR 8.7 bn.	European Commission	On 22 May 2013 the Board of Directors of the Bank announced the issue of 2,274 million new shares with a nominal value of EUR 0.30 at a price of EUR 4.29 per share. The participation of the HFSF in the share capital increase of the Bank therefore amounted to EUR 8 677 million.
Nova Ljubljanska Banka	Slovenia	March. 2011	EUR 0.25 bn.	European Commission	Nova Ljubljanska Banka (NLB) raised EUR 250 million of equity capital, equivalent to 1,6 % of its risk weighted assets, through a public offering of its shares. All the shares were ultimately fully subscribed by the State of Slovenia. This Recapitalization measure was approved by the European Commission on 7 March 2011.
	Slovenia	July. 2012	EUR 0.39 mill.	European Commission	Slovenia provided EUR 382.9 million to NLB in the form of contingent convertible instruments (hereinafter "CoCos") qualifying as Core Tier 1 capital instruments under the applicable regulations. NLB converted the CoCos into its own ordinary shares in March 2013 in accordance with the term of the agreement governing the CoCos.
	Slovenia	Dec. 2013	EUR 1.58 bn.	European Commission	After the results of the stress tests, NLB has a capital shortfall of EUR 1.8 billion. The State of Slovenia provided an additional capital of EUR 1.58 billion in the form of government bonds and cash to enable the bank to return to viability.

Table B.4.1. (cont.)

	State AID	Date	Amount	Source	Notes
Parex Banka	Latvia	Nov. 2008	LVL. 0.2 bn.	European Commission	On November 2008, the Latvian state undertook to invest up to 200 million LVL into the bank's Tier-2 capital, by granting to it subordinated term debt with a maximum maturity of 5 years.
	Latvia	Dec. 2011	LVL. 0.049 bn	European Commission	By 31 December 2011, LVL 49.5 million out of LVL 118.7 million of liquidity support were actually converted into capital.
RBS	United Kingdom	Oct. 2008	GBP 20 bn.	European Commission	RBS's Recapitalization was announced on 13 October 200820 and completed, in the form of both ordinary shares and preference shares, on 1 December 2008.The British State injected GBP 15 billion into RBS through the acquisition of ordinary shares and the subscription of GBP 5 billion of preference shares. This gave the State a 58% stake in the company.
	United Kingdom	Nov. 2009	GBP 25.5 bn.	European Commission	A new aid package was announced on 3 November 2009, which includes an up-front Recapitalization of GBP 25.5 billion, and a five year contingent commitment to subscribe for an additional GBP 8 billion of capital in B shares in the event that RBS's Core Tier 1 capital ratio were below 5%. The proposed up-front Recapitalization will come in the form of B-shares. The B-shares are non-voting Core Tier 1 capital.
Societe Generale	France	Dec. 2008	EUR 1.70 bn.	European Commission	The French Capital-injection scheme for banks set up the Société de Prise de Participation de l'État with the aim of participating in operations to inject capital into sound financial institutions, or to rescue operations for financial institutions in difficulty. Under this scheme, Societe Generale received a capital injection from the SPPE which subscribed subordinated debt securities (TSS), qualified as Tier 1 Capital.
UBS	Switzerland	Dec. 2008	SFR. 6 bn.	Swiss National Bank	On December 2008, UBS received a capital injection of SFR 6 billion (EUR 3.9 billion) in mandatory convertible notes resulting in a tier 1 capital injection
Wells Fargo	U.S	Oct. 2008	USD 25 bn.	U.S Dep.of Treasury	CPP (Capital Purchase Program)
WestLB	Germany	March. 2008	EUR 5 bn.	European Commission	In March 2008, WestLB's owners established a guarantee of EUR 5 billion (risk shield). The risk shield provided the legal basis for the transfer of impaired assets from WestLB to a special purpose vehicle (SPV) so that WestLB did not have to incorporate the impact of market volatility related to these portfolios into its accounts. The European Commission considered that the effect and the character of the € 5 billion guarantee, which allowed the bank to free up its balance sheet from a € 23 billion portfolio, is similar to that of a capital injection. The aid amount was thus comparable to the capital, which would have been required to achieve the same effect in keeping the portfolio on balance.

Non recapitalized underwriters: Ahorro Corporación Financiera,ANZ,APG Algemene Pensioen Groep,Astrup Fearnley,Banca Akros,Intesa Sanpaolo,Banca March,Banco Caminos,Banco de Sabadell,Banco Espirito Santo,Banco Popular Espanol,Bank of China,Bankinter,Barclays,BBVA,Belfius Bank & Insurance,Bank of Montreal,Caixa Galicia,CaixaBank,CaixaBI,Canaccord Genuity Corp,Cecabank,Centrobanca,China Construction Bank,Canadian Imperial Bank of Commerce,Close Brothers,Commonwealth Bank of Australia,Credit Suisse,Daiwa Securities,Danske Bank,DBS,Deutsche Bank,DNB Markets,Dresdner Kleinwort,DZ Bank,EuroLand Finance SA,GMP Capital,Helaba,HSBC,Industrial & Commercial Bank of China,Investec Bank,Itau BBA,Jefferies LLC,KKR,Lehman Brothers,Macquarie Group,Mediobanca,Merrill Lynch,Mitsubishi UFJ Financial Group,Mizuho,MM Warburg,National Australia Bank,National Bank Financial,Natixis,Nomura,Nordea Markets,Oddo & Cie,Pohjola Group,Pareto Securities,Petercam,Privatbanka as,Privredna Banka Zagreb,Quirin Bank AG,Rabobank,Raiffeisen Bank International,Raiffeisenlandesbank Oberoesterreich,Royal Bank of Canada,Renta 4,Santander,Scotiabank,SEB,Sociedad General de Valores y Cambios,Standard Chartered Bank,Steubing AG,Sumitomo Mitsui Financial Group,Svenska Handelsbanken,Swedbank,Toronto Dominion,TradeRisks,UniCredit,Vontobel,Westpac,Zuercher Kantonalbank.

64 recapitalization measures / 36 banks recapitalized / EUR 164.365 bn.,USD 160 bn.,GBP 62.5 bn., 0.249 n., 6 bn.

CHAPTER 5

Conclusions

5.1. Summary of conclusions

This doctoral thesis focuses on the analysis of different aspects of the intermediation role performed by specialized financial intermediaries known as underwriters in capital markets. Each of the three essays presented in this thesis focuses on a particular issue concerning underwriting and reputation. The chapters are grouped around three specific issues. Firstly, this analysis explores the issuer–reputable underwriting matching for non-financial issuers and banks. Then, the underwriting syndicate formation is examined. Finally, reputation is disentangled by examining the evolution of underwriters' market shares.

The first essay (second chapter) addresses the question of whether banks and industrial companies have equal access to debt markets through reputable underwriters. While the extant studies have been devoted to assessing the issuer–underwriter reputational matching and its main determinants in non-financial deals, this paper contributes to the literature by examining this matching mechanism for banks. Based on a theoretical background regarding the informational differences between banks and non-financial firms, it seems reasonable to explore whether these differences also appear in their access to markets in which only banks can act as underwriters. The research question is empirically tested by comparing the likelihood of non-financial companies and banks matching with a reputable underwriter over the period 2003–2013. The results show no differences before the crisis in the access of banks and non-financial companies to reputable underwriters, but banks had a lower probability during the subprime and banking crisis. These findings suggest that banks' informational advantages in debt markets could be challenged over time, since the perceived quality of their distinctive certification role may change, especially as happened during the financial crisis, when other reputational issues affect the certification value. Furthermore, differences in the

matching determinants are found; in particular, bond size has a greater effect on the matching probability for non-financial companies and bank size is relatively more decisive for banks.

The second essay (third chapter) addresses the question of whether lending relationships may have an impact on the choice and structure of bond underwriting syndicates. While the common practice in issuing debt has moved from the use of a sole bank as an underwriter to underwriting syndication, this study aims to examine the reason for this change. In this sense, previous studies have argued that issuers' relationships affect the probability of choosing a bank as an underwriter. However, there is no evidence on how the concentration of these relationships influences the decision on whether to syndicate the issuance or remain with a sole underwriter before and during the crisis as well as on the structure of the syndicate formation.

Empirically, this essay firstly studies the choice of a single underwriter vs. multiple underwriters of the bond. Then, a probit model is employed to determine the likelihood that specific underwriters are included in a syndicate, including one observation for every potential underwriter for each bond. This methodology allows for correlation across all the eligible underwriters in a specific deal. Therefore, it is considered the chance that, if an underwriter is chosen for a deal, it may affect whether or not another underwriter is chosen for this same deal. Besides, we use an additional probit model that treats each underwriter in a syndicate deal as a different observation to examine the determinants of the syndicate structure from the perspective of the underwriter. Using a sample of European corporate bonds during the period 2003–2013, the results obtained show that prior lending relationships have a significant impact on the syndicate choice and that this effect is particularly significant during the crisis. Furthermore, it is found that reputable banks refrain from joining a syndicate if they

perceive that they are matching with less reputable counterparts. These results suggest that syndicate formation is driven by lending relationships as well as by underwriters' reputational concerns.

Finally, the third essay (fourth chapter) aims to explain underwriters' market shares in corporate debt issuance. Theoretically and empirically, the role of intermediary reputation is well established through an examination of the way in which reputation affects pricing and performance. Empirical models of reputation in most cases use market share as a proxy for reputation, arguing that the highly prestigious underwriters are those with large market shares. However, the empirical evidence related to the evolution of underwriters' market shares is sparse. This essay contributes to the literature analyzing the effects of pricing and non-pricing competitive factors on banks' reputation as underwriters in corporate bond markets. Furthermore, it explores how banks' reputation as underwriters is affected when they receive state aid for recapitalization. In this sense, an examination of the effects of recapitalization measures is particularly relevant, since the information disclosed on the beneficiary might have an effect on a reputational business such as underwriting.

Employing dynamic panel regressions, it is found that in Europe competition is not based either on charging abnormal fees or on abnormal pricing, unlike the situation in the U.S. capital markets. We find that offering highly reputable analysts with valuable research coverage during the placement process serves to attract business. Finally, the underwriter's market share is also found to be positively affected by mandates that entail providing joint lending and underwriting services. Then, using a difference-in-difference approach, it is found that market shares are affected after being bailed out. While underwriters with large market shares (considered reputable underwriters) suffer losses in their underwriting market shares after being recapitalized (by 22.66% from their

median market share), those underwriters without large market shares increase their market shares after being bailed out (by 63.66%). These results, robust to different identification and measurement checks, seem to be consistent with the reputational hypothesis.

5.2. Directions for further research

The recent changes in the underwriting industry and the implication of reputation in non-equity markets suggest that additional empirical research remains to be conducted. Reputation has been explored largely in equity markets, with many studies focusing on IPOs and SEOs. However, papers on debt markets continue to be scarce. Furthermore, while loan syndication is not a novelty, the underwriting syndication is a recent phenomenon. Therefore, the potential risks and benefits for issuers and underwriters remain a pending topic for future research. In this sense, there is much work to be carried out regarding the drivers of that change. Particularly, an in-depth analysis of the impact of commercial banks on underwriting and how their reputation in commercial banking might be extrapolated to investment banking activities needs to be undertaken.

Furthermore, the increasing importance of underwriting league tables, in which banks are ranked according to their volume of business, should be explored to determine whether these rankings might provide an incentive to engage in strategic behaviors with the aim of climbing in the rankings.

Finally, the fact that the value of reputable underwriting can be analyzed from different perspectives (investors, issuers, and banks) provides an advantage for future research.