# Common information asymmetry factors in syndicated loan structures

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## ARTICLE INFO

## ABSTRACT

This paper provides a comprehensive study of the syndicate structure and its relationship to information asymmetry and loan spread by using principal component analysis on a large set of 40 structure-related variables. A total of six structure components are identified and related to syndicate quality, syndicate members' heterogeneity or share concentration, lead arranger's characteristics, lead lender's or syndicate's location, lender–borrower relationships, and lead institution type. In multivariate settings, all six components are significant determinants of loan spread, either directly or indirectly through their impact on other components. Lead share retention, previous lender–borrower relationships and syndicate quality are shown to be bilaterally related to loan spread. Structure components differ regionally, which can provide an explanation for the European pricing discount observed in the literature. An Asian discount is observed and cannot be explained by structure differences.

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## 1. Introduction

Extensive research conducted in the past 15 years on syndicated loans concludes that one of the key differences between syndicated loans and bilateral loans (or sole lender loans) is the addition of within-syndicate information asymmetries. The way the syndicate is structured serves as a mechanism to address potential agency problems that can arise in such a context. However, the syndicate structure is complex and involves many characteristics that may mitigate or enhance within-syndicate information asymmetries and their associated premium. Therefore, despite the fact that syndicated loans have, by definition, more information asymmetries (between syndicate members) than bilateral loans, the overall level of this information asymmetry is hard to determine and can still vary from one syndicate to another.[1]

Although recent papers have examined the impact of the structure on loan terms or the link between structure and information asymmetry, most have focused on one or two structure measures

at a time, typically retention by the lead arranger and the number of lenders. Although very important, these variables do not capture the multidimensionality of the syndicate structure that includes many different characteristics that combine and interact to increase or decrease the diversification and information asymmetry premiums of a loan.[2] Judging the information asymmetries within a syndicate solely on its size or arranger retention overlooks a variety of factors that can influence them. These factors range from previous lender–lender or lender–borrower relationships to the difference in experience between the lead and syndicate participants.

The first purpose of the paper is therefore to identify the principal components of the syndicate structure. This will not only allow us to capture all the major characteristics of a syndicate structure without generating unnecessary multicollinearity or overidentification problems in multivariate settings, but also to combine structure metrics into a small number of significant, easily interpretable, components. These components are not only useful to better understand the multidimensionality and complexity of a syndicate structure through parsimonious models but also to compare the structure of different syndicates along more than one factor. The second objective of the paper is to use these structure components in a multivariate setting to better understand how

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[1] As evidenced, for instance, by the high standard deviations of the structure variables and components in the sample, available in Tables 1 and 3 and discussed later.

[2] See Ivashina (2009) for a complete discussion of these two premiums.

they are related to one another and to information asymmetries and to test their impact on loan spreads.

The contributions of this paper to the syndicated loans literature are threefold. First, by identifying common syndicate structure factors related to information asymmetries across syndicated loans, this paper provides a new approach to characterize and quantify the multidimensional structure of a syndicate. While most papers focus on one or two variables, usually related to syndicate size and lead share retention, to proxy for syndicate structure, we use a large set of variables to capture different aspects of a syndicate that may increase or reduce information asymmetries. Starting with this set of 40 structure variables, we show that six components account for more than 60% of the variability in international syndicate structures and that the components can be interpreted as the quality of the syndicate, the heterogeneity of its members and syndicate concentration, the characteristics of the lead arranger, the geography of the syndication and its lead arranger, the average relations between the borrower and the syndicate members, and the lender institution type. Second, this paper re-examines the impact of syndicate structure on loan spreads using principal components that capture the multidimensionality of syndicate structure, and finds that all six components are significant determinants of loan spread, either directly or indirectly though their impact on other structure components. This simultaneous estimation of different structure variables has never been done, and results support a number of different theories purported to explain loan spreads, such as the agency, certification premium and home bias theories, and offer new insights into their interaction.[3] Further, we show that lead arranger share retention is not the only structure-related endogenous determinant of spread, and that syndicate quality and previous lender–borrower relationships are also bilaterally related to loan spread.

Finally, we use structure components to compare three major syndicated loan markets: US, Europe and Asia. We find that structure components, as well as their impact on loan spread, differ regionally. US syndicates are, on average, of higher quality and with more reputable and more-experienced lead arrangers than European or Asian syndicates. They are also associated with the strongest and longest lender–borrower relationships. Further, loan spreads are less sensitive to most structure components in Europe than in the US, while they are less sensitive to lead arranger characteristics and syndicate concentration in Asia, everything else held equal. Results also provide an explanation for the European pricing discount observed in the literature. Specifically, the observed discount can be attributable to different syndicate structures for European borrowers, which lead to lower diversification and certification premiums, respectively. Finally, a new Asian pricing discount is observed, which cannot be explained by different syndicate structures.

The remainder of the paper is organized as follows. Section 2 reviews the literature on determinants of syndicate structure and loan spreads. Section 3 presents the methodology and the results obtained from the principal component analysis. Section 4 tests the components in univariate and multivariate models of loan spread and syndicate structure. Section 5 concludes the paper.

## 2. The determinants of syndicate structure and loan spread

To our knowledge, no previous study has addressed the issue of the multidimensionality of the syndicate structure and the identification of structure components. However, there is a large body of literature on the relationship between syndicate structure and

information asymmetries and on the relationship between the structure and loan terms.

### 2.1. Syndicate structure and information asymmetries

The structure of a loan syndicate has been extensively studied in the past 15 years. This research has generally concluded that the structure is conditioned by information asymmetries. Specifically, lender–borrower information asymmetries create information asymmetries or frictions between syndicate members that may lead to agency problems. There are two types of agency problems observed in this context: moral hazard and adverse selection problems. The first problem, moral hazard, occurs when the lead arranger reduces its incentive to monitor the loan optimally once it is not responsible for the totality of it (Jensen and Meckling, 1976). The second problem, adverse selection, arises when the lead arranger has private information about the borrower acquired through due diligence or prior relationships with the borrower. If the other members of the syndicate do not have access to this information, a lemons problem can occur if the lead retains a larger portion of the best-quality loans and a smaller portion of the lower-quality loans. The two types of agency problems have been studied in the context of syndicated loans, as detailed in the following paragraphs.

While the structure of the syndicate can theoretically be seen both as a consequence of or a solution to agency problems, studies generally conclude that the syndicate is structured to reduce information asymmetries between the participants involved. In accordance with adverse selection predictions, the characteristics of the lead arrangers have been shown to be significant determinants of syndicate structure. For example, the proportion of the loan that is retained by the lead arranger is shown to be negatively related to the reputation of the lead (Panyagometh and Roberts, 2010). The quantity and quality of information about the borrower also have an impact on the syndicate structure. They are negatively related to the share retained by the lead lender (Simons, 1993) and positively related to the number of lenders in the syndicate (Dennis and Mullineaux, 2000). Panyagometh and Roberts (2002) find that lead lenders syndicate a larger portion of loans that are subsequently upgraded, a sign that lead banks do not engage in exploitative behavior, while Jones et al. (2001) observe a negative relation between loan rating and lead share. However, they highlight that arrangers may still exploit their informational advantage and syndicate more of the low quality loans than the syndicate members would have accepted under a symmetric-information environment.

Consistent with moral hazard, loan syndicates can also imply a free riding problem that reduces each lender's incentive to monitor and renegotiate if necessary. For instance, Preece and Mullineaux (1996) find that the syndicate size (i.e. the number of lenders) is negatively related to abnormal returns following loan announcements because of the higher renegotiation costs. Further, Esty and Megginson (2003) conclude that fewer lenders represent best practices to promote monitoring efficiency and flexibility in restructuring and that, in countries with strong creditor rights and reliable legal enforcement, lenders create smaller and more concentrated syndicates to facilitate monitoring and low cost contracting. Lee and Mullineaux (2004) observe that smaller and more concentrated syndicates can avert hold-out behavior by syndicate members or coordination problems in renegotiations. Sufi (2007) observes that lead arrangers retain a larger share and form more concentrated syndicates when borrowers require more intense due diligence and monitoring. Lead arranger reputation or past lead–borrower relationships can help mitigate the information asymmetries within the syndicate. Nonetheless, because low cost restructuring can encourage borrowers to default strategically,

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[3] See, for example, Dennis and Mullineaux (2000), Sufi (2007), Ivashina (2009), Cook et al. (2003), and Carey and Nini (2007). The theories are discussed in more detail in Section 2.