

# The Agency Structure of Loan Syndicates

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## Abstract

Leaders of loan syndicates often delegate some administrative tasks to banks known as co-agents. One reason is that co-agents are specialized banks that help split the costs of managing the syndicate. Another reason is that co-agents monitor the leader on behalf of syndicate members to mitigate informational asymmetry problems. Large sample tests on the Dealscan database provide support for both arguments. Evidence of repeated contracting between the same banks explains the moderate magnitude of monitoring effects.

*Keywords:* loan syndication, monitoring, bank specialization, co-agents

*JEL Classification:* G21

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## 1. Introduction

Loan syndication is a widely used financing channel for corporations. The Loan Pricing Corporation reports an average annual syndicated loan volume of \$1.947 billion between 1999 and 2005 with a significant rise in activity near the end of the period. The loan syndication process starts with negotiations between the borrower and a bank (the *arranger* or *leader*) on the terms and provisions of the debt contract. The arranger then collects confidential bids from other banks (the *members*) regarding their contributions to the loan. Finally, she proceeds to the allocation of the loan parcels. In addition to initiating and setting up the syndicate, the arranger has to issue the legal documents, administer the loan, and hold the collateral, if any. In practice, however, the arranger often delegates these administrative tasks to other banks, which act as co-agents. For instance, the “documentation agent” drafts the loan documents, the “administrative agent” calculates the interest payments and collects loan repayments, and the “collateral agent” is in charge of the pledged collateral. The decision to delegate some of these tasks is made solely by the arranger.

Earlier studies on loan syndication consider that a single bank manages the syndicate. In this paper we analyze the syndication structure at a finer level, namely the distinction between the lead arranger and co-agents. To the best of our knowledge, no other paper analyzes the agency structure of loan syndicates. Two competing, yet not exclusive, hypotheses can explain the agency structure of loan syndicates. On one hand, the *specialization* hypothesis, consistent with Das and Nanda (1999), states that multiple co-agents arise in loan syndicates because of the different competitive advantages they have for performing all the administrative tasks. On the other hand, the *monitoring* hypothesis states that multiple co-agents arise in loan syndicates to mitigate informational asymmetry problems. As shown by Strausz (1997), the delegation of monitoring to a third party (in our case, co-agents) can effectively reduce agency conflicts. Based on this theoretical discussion, we derive six testable implications on observable characteristics of syndicated loans. We test the implications on a sample of 1,181 loans between 1992 and 2003. Overall, we find strong evidence supporting both the specialization and monitoring effects. A subsample analysis reveals that specialization effects are more pronounced for relatively small loans while monitoring effects are dominant for short-term loans. Finally, we provide evidence of repeated contracting between leaders and co-agents (which is consistent with the specialization hypothesis), and between leaders and participants (which attenuates monitoring effects).

## 2. Literature review and hypotheses

### 2.1. Related literature

Earlier theoretical work focuses on the rationale for loan syndication. Wilson (1968) and Chowdhry and Nanda (1996) put forward the risk-sharing function of the syndicate. According to Pichler and Wilhelm (2001), syndication emerges as the

structure that best copes with moral hazard in team production. The existence of a lead bank, subject to reputational concerns, combined with implicit barriers to entry, makes syndicates Pareto-dominant forms. Another justification for loan syndication is that it helps lenders circumvent stringent regulations regarding bank capital requirements and lending limits. Supporting this view, Simons (1993) and Jones, Lang, and Nigro (2005) find that agent banks that are more capital-constrained retain smaller loan shares.

Papers most closely related to ours are those that investigate the *ownership structure* of the syndicate, that is, the number of participating banks and the concentration of holdings in the syndicate. Lee and Mullineaux (2004) find a positive association between large or diffuse syndicates and the information available about the borrower, the credit risk of the loan, the collateral, the reputation of the lead bank, constraints on loan resale activity, loan maturity, and the importance of the borrower's growth options. Their results hold when controlling for the listing status and credit rating of the borrowers. Lee and Mullineaux (2004) conclude that group monitoring matters in the loan market as agency and information costs affect the syndicate structure. Sufi (2007) finds evidence suggesting that lead arrangers look for more participants in the syndicate to make renegotiation more difficult, which discourages opportunistic behavior by the borrower. Esty and Megginson (2003) focus on the effect of political risk on syndicate structure. They find that, in the context of the international project finance market, a diffuse ownership structure is also associated with weak creditors' rights and poor legal enforcement.

## *2.2. The specialization hypothesis*

The first rationale for multiple co-agents is based on a *specialization* argument. Das and Nanda (1999) present a model of a banking structure where, in equilibrium, banks involved in relationship-specific transactions tend to underspecialize in their skills, whereas banks involved in deal-specific transactions tend to overspecialize. In the model, syndication appears to be an efficient way to allow banks to specialize optimally. In other words, banks act in the syndication process according to the competitive advantage that they have in performing different administrative tasks.

Consistent with the predictions of Das and Nanda (1999), several papers provide international evidence of productive specialization in the banking sector (for instance, Mukherjee, Ray, and Miller, 2001; Maudos, Pastor, and Perez, 2002). Little is known, however, about how much this specialization affects the structure of bank syndication. Melnik and Plaut (1996) study the structure of the Eurocredit underwriting market. They find that leaders of these syndicates are recruited mostly to share the costs of bearing risk. However, additional managers of the syndicate do not seem to arise for risk-sharing reasons. Rather, they assist the leader in dealing with an expanded underwriting distribution, which suggests that they help in splitting the costs of managing the syndicate. Song (2004) finds evidence of clientele effects in loan syndication.

She suggests that highly specialized underwriters co-manage loans to enhance their services in response to clients' specific needs.

### 2.3. *The monitoring hypothesis*

The second rationale for multiple co-agents is based on the *monitoring* hypothesis. Syndication enables the arranger to transfer some of the borrower's credit risk to other banks. However, since the arranger is the only bank to negotiate with the borrower, she is usually the best informed bank regarding the corporation's financial status. As a result, the syndication process leaves room for adverse selection and moral hazard. Adverse selection occurs if the arranger systematically decides to syndicate the most risky loans.<sup>1</sup> Moral hazard occurs if the arranger loosely monitors the borrower because she has a very limited stake in the loan.

A classic topic in agency theory is the study of moral hazard problems in team production (e.g., Alchian and Demsetz, 1972; Holmström, 1982). The syndication process is an example of this issue. Pichler and Wilhelm (2001) develop an agency model to explain the formation of syndicates. They consider that the syndicate is managed by a single arranger and therefore they do not address the issue of its agency structure. In this paper, we conjecture that agency theory can also account for the presence of co-agents in loan syndicates.

In the agency theory framework, co-agents arise in the syndicate as banks are mandated to supervise the arranger. In other words, the arranger delegates the syndication agency to co-agents to mitigate the informational asymmetries between the agents and the members of the syndicate. In a model where signals are private information and commitment to monitoring is not possible, Strausz (1997) studies the impact on the principal-agent relationship of the introduction of a third player, namely a supervisor who has been delegated as monitor. Strausz (1997) shows that delegation of monitoring is profitable in that the principal can better regulate incentives. First, as co-agents get involved in the syndicated loan, they acquire more accurate information on the borrower. They can monitor the arranger on behalf of the members and determine whether the creditworthiness of the borrower is acceptable for the benefit of the syndicate (note that co-agents' reputation is at stake). Co-agents can therefore mitigate the adverse selection problem. Second, since co-agents own parcels of the loan, they have an incentive to closely monitor the borrower. Thus, members expect that co-agents also help mitigate the moral hazard problem.

Narayanan, Rangan, and Rangan (2004) study the market for seasoned equity offerings, and examine whether the underwriting banks use their lending-generated private information at the expense of investors. They find evidence that the syndication structure, through the involvement of co-managers, induces these banks to credibly commit against any opportunistic behavior. In this paper, we investigate whether a comparable phenomenon applies to the loan syndication market.

<sup>1</sup> Dai (2002) suggests that adverse selection problems may worsen if banks have heterogeneous screening abilities. Loan syndicates would then be subject to herd behavior from inferior banks that rely on superior banks' (e.g., the arrangers') credit decisions.

### 3. Testable implications

The *specialization hypothesis* claims that co-agent banks share administrative functions according to the competitive advantage they have in performing their tasks. The *monitoring hypothesis*, consistent with agency theory, argues that co-agents result from the delegation of monitoring and help mitigate adverse selection and moral hazard problems. The agency structure of the syndicate responds to characteristics of the loan to (1) reduce the cost of syndication according to the specialization hypothesis, or (2) mitigate informational asymmetries according to the monitoring hypothesis.

In this section, we derive testable implications that relate the extent of delegation in the syndicate to main loan characteristics, namely the level of fees, the borrower's credit quality, the number of covenants, the loan maturity, the number of participants (i.e., mere lenders not acting as co-agents), and the lead arranger's share of the loan.

Competition among specialized banks should bring down the cost of managing the syndicate. Thus, according to the specialization hypothesis, the leader will charge low fees for loans that are to be handled by many co-agents. Supporting this view, Melnik and Plaut (1996) find evidence that co-agents in the market for syndicated Euroloans mostly act as "service-for-fee" players.

**Implication 1:** *The specialization hypothesis predicts a negative relation between fees and delegation.*

Adverse selection and moral hazard problems are more severe when the borrower's credit quality is poor. The monitoring hypothesis predicts that in this case, the arranger will choose a higher degree of delegation. Sufi (2007) finds the size of the syndicate to increase with the borrower's estimated risk of default. However, he does not analyze the agency structure of the syndicate.

**Implication 2:** *The monitoring hypothesis predicts a negative relation between the borrower's creditworthiness and delegation.*

As initially put forward by Smith and Warner (1979), covenants serve as an *ex post* monitoring device. According to the monitoring hypothesis, covenants and co-agents can be seen as substitutes because they both help mitigate the moral hazard problem. Goyal (2005) and Harvey, Lins, and Roper (2004) conduct empirical studies supporting this view for the U.S. bank debt market and the emerging debt market, respectively. Bradley and Roberts (2004) focus on the syndicated loan market and also find that the use of covenants is consistent with agency theory. However, studies are not unanimous on the monitoring role of covenants. For the U.S. bond market, Nash, Netter, and Poulsen (2003) find evidence that high-growth firms include few covenants in their debt contracts because they prefer maintaining flexibility in financing rather than reducing agency costs.

Nevertheless, the monitoring role of covenants must be balanced with their implementation cost. For instance, Viswanath and Eastman (2003) model the use of covenants as a trade-off between the cost of implementing the contract and the residual agency costs. If the specialization hypothesis holds, a loan with many covenants is

more expensive to manage, all else being equal. In this case, the lead arranger is more likely to look for additional co-agents to split the cost of managing the syndicate. Thus, according to the specialization hypothesis, loans with many covenants should exhibit more delegation.

**Implication 3:** *The specialization hypothesis predicts a positive relation between the number of covenants and delegation. The monitoring hypothesis predicts the opposite relation.*

Narayanan, Rangan, and Rangan (2004) report evidence of economies of scale in managing loans. A longer maturity helps the leader amortize the fixed cost component of the loan. For short-term loans, however, the leader seeks to lower its fixed costs by increasing delegation. The specialization hypothesis therefore predicts a negative relation between loan maturity and delegation.

In the agency theory, short-term debt is more efficient in alleviating conflicts between shareholders and creditors (e.g., Myers, 1977; Berglöf and von Thadden, 1994). Barclay and Smith (1995), Guedes and Opler (1996), and Johnson (2003) provide evidence on short-term debt mitigating the underinvestment problem. Gonas, Highfield, and Mullineaux (2004) find that longer maturity loans are more prone to collateralization to reduce adverse selection and moral hazard. Thus, according to the monitoring hypothesis, co-agents more likely arise in long-term loans.

**Implication 4:** *The specialization hypothesis predicts a negative relation between loan maturity and delegation. The monitoring hypothesis predicts the opposite relation.*

The number of participants also represents monitoring effects in the syndicate. When the leader (agent) is not monitored by a single but by many participants (principals), agency theory predicts that coordination problems between principals induce further inefficiencies (see, for instance, Bernheim and Whinston, 1986). The monitoring hypothesis therefore suggests that agency conflicts are potentially more severe when there are many participants in the syndicate.<sup>2</sup> The leader will have to increase delegation to restore an effective loan monitoring.

**Implication 5:** *The monitoring hypothesis predicts a positive relation between the number of participants (i.e., mere lenders not acting as co-agents) and delegation.*

Finally, the leader decides on the share of the loan that she is willing to take. According to the monitoring hypothesis, this decision can strongly affect the syndicate structure. By retaining a big share of the loan, the leader better aligns her incentives with those of the participants. The leader can more easily convince members of the syndicate of her nonopportunistic behavior. By contrast, leaders with a low stake in

<sup>2</sup> There is an important caveat, however. In practice, the arranger often begins the syndication process with informal rounds to determine the banks that are interested in participating in the syndicate. In some cases, however, co-agents and mere participants may arise simultaneously in the syndicate. Results concerning the variable “Participants” should therefore be interpreted with care.

the loan rely on a highly delegated syndicate to persuade participants of a low risk of adverse selection and moral hazard.

**Implication 6:** *The monitoring hypothesis predicts a negative relation between the share of the leader and delegation.*

## 4. Empirical design

### 4.1. Variables

The primary proxy for delegation in the syndicate is the number of co-agents. This is the number of banks in the syndicate having a responsibility in the administration of the loan. These banks are distinct from the leader and other banks that only act as lenders. According to the specialization argument, the more the leader wishes to delegate the administration of the loan to specialized banks, the more co-agents she will include in the syndicate. According to the monitoring hypothesis, lenders will expect more effective monitoring as the number of co-agents increases. In particular, the risk of collusion among co-agents and the leader vanishes with more co-agents.<sup>3</sup>

Two alternative dependent variables complete the analysis. The first one is the share of the loan held by all co-agents. The second one is the concentration among co-agents measured by the Herfindahl index of co-agents' loan shares. Denoting  $m_i$  the amount lent by co-agent  $i$  in a loan with total facility  $M$ ,

$$\text{co-agents' share of the loan} = 100 \times \frac{1}{M} \sum_i m_i$$

$$\text{concentration among co-agents} = 100 \times \sum_i \left( \frac{m_i}{\sum_j m_j} \right)^2.$$

Delegation is a positive function of co-agents' share of the loan, and a negative function of concentration among co-agents, since the latter measures the dispersion of monitoring that could lead to collusion.

Consistent with our testable implications, the explanatory variables are as follows. Total fees ("Fee") are expressed in basis points as the sum of upfront fees, commitment fees, other fees, and annual fees. The total fees are shared between the leader and co-agents. The fraction of total fees that specifically accrues to co-agents is not available in general. As a measure of borrower creditworthiness, we use Standard & Poor's senior long-term debt rating prevailing at the loan inception. The Dealscan database provides this rating in most cases. We retrieve the rating for around 50 additional loans in the Fixed Investment Securities Database (FISD). The variable

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<sup>3</sup> It could be argued that a smaller number of co-agents increases the effectiveness of monitoring by increasing the quality of coordination and reducing the free-rider problem. The median number of co-agents in our sample is four. Hence, monitoring effectiveness is not significantly diluted if the number of co-agents goes above the median. However, the risk of collusion is significantly increased if the number of co-agents goes below the median.

“Rating” is a dummy with value 1 if the borrower’s rating belongs to the investment grade category.

The variable “Covenants” counts the number of financial covenants included in the loan.<sup>4</sup> The loan maturity (“Maturity”) is expressed in months. The number of participants (“Participants”) is simply the number of banks in the syndicate that are neither leader nor co-agent. The variable “Leader share” is the share of the leader expressed as a percentage. The loan facility amount (“Loan size”) is in nominal U.S. dollars. The logarithm of the borrower’s annual sales in U.S. dollars (“Firm size”) is a proxy for firm size.

Twenty-two dummy variables (not reported in the regression tables) control for the loan purpose (four variables for five categories), the borrower’s industry (seven variables for eight industries), and the year of the loan inception (11 variables for 12 years).<sup>5</sup>

#### 4.2. *The data*

Syndicated loan data come from Dealscan, a Reuters Loan Pricing Corporation database. Recent studies on syndicated loans use this database (e.g., Angbazo, Mei, and Saunders, 1998; Dennis and Mullineaux, 2000; Dichev and Skinner, 2002; Esty and Megginson, 2003). Around three quarters of the loans in the database are denominated in U.S. dollars. Borrowers from North America and Western Europe account for 90% of the syndicated loan volume. Over the last few years, three banks (JP Morgan, Bank of America, and Citigroup) have led between 40% and 50% of the market.

At the time of data extraction, the database contains 82,166 observations from 1992 to 2003. In Dealscan, the basic unit of observation is the *loan facility* or *tranche*. In practice many firms group the tranches into “deals.” However, tranches (which we call “loans”) are the focus of our analysis since they exhibit very different patterns in terms of maturity, size, syndication structure, and so forth. We restrict the sample to syndicated loans (56,698 observations). We also exclude 26,338 tranches with a nominal amount below \$100 million; such small loans are unlikely to have complex agency structures.<sup>6</sup> Excluding financial and government institutions (SIC codes between 6000 and 6999, and between 9100 and 9999) yields 21,922 loans. We exclude loans where Dealscan does not identify the lead arranger, the number of co-agents and participants, or number of covenants, which reduces the sample to 1,607 tranches. The borrower’s sales and SIC code are sometimes missing from Dealscan, in which

<sup>4</sup> No information on the tightness of the covenants is available from Dealscan.

<sup>5</sup> Industry is represented by one-digit SIC codes (0–5, 7, and 8 appear in the sample). The five purpose categories are: (1) capital budgeting (including capital expenditure, project finance, acquisition), (2) long-term financing (including recapitalization, debt repayment), (3) short-term financing (including working capital, CP backup), (4) restructuring (including takeover, LBO/MBO, spinoff, debtor-in-possession, stock buyback), and (5) other general purpose.

<sup>6</sup> Altman and Suggitt (2000) as well as Esty and Megginson (2003) also exclude the smallest tranches in their analysis of syndicated loans.

Table 1

**Year, industry, and purpose of 1,181 syndicated corporate loans, 1992–2003**

The sample, extracted from the Dealscan database, ends in June 2003 (incomplete year).

Year	Panel A	Panel B		Panel C	
	Loans	SIC code	Loans	Loan purpose	Loans
2003	47	0–999	2	Capital budgeting	32
2002	182	1000–1999	100	Long-term financing	384
2001	240	2000–2999	221	Short-term financing	341
2000	268	3000–3999	253	Restructuring	250
1999	206	4000–4999	322	Other general purpose	174
1998	109	5000–5999	139		
1997	84	7000–7999	98		
1996	26	8000–8999	46		
1995	7				
1994	10				
1993	1				
1992	1				

case we search for them in Mergent Online and on the borrowers’ web sites. We exclude the 92 loans for which the co-agents’ shares are not disclosed, which leaves 1,517 loans. Finally, we retain only loans for which a rating is available at the time of loan inception. The final sample contains 1,181 observations.<sup>7</sup> Our final sample size is comparable to previous studies that use Dealscan. Esty and Megginson (2003) and Dichev and Skinner (2002) report samples of 495 and 1,313 loans, respectively.

Deal dates range from January 21, 1992 to June 23, 2003. Table 1 reports the number of loans in the final sample by year, industry, and purpose.

Most loans are issued in the last five years of the sample period. There are two reasons for the over-representation of recent loans. First, Dealscan is growing rapidly and more loans come from the more recent years; Figure 1 shows that loans issued from 1992 to 1995 are under-represented. Second, our selection criteria require knowledge of the agency structure of loans. Old deals seldom disclose this information. As a result, the sample extraction increases the over-representation of recent loans, as shown in Figure 1.

Table 1 also shows that all economic sectors appear in the sample. Manufacturing companies and utilities are the most represented. Syndicated loans are contracted for various purposes, although the capital budgeting purpose seems under-represented. This may not reflect the real economic activity, however. Indeed, many firms financing an investment opportunity prefer to a fall in the “other general purpose” category to avoid disclosing their capital budgeting policy.

Table 2 reveals the diverse and sometimes complex agency structure of syndicated loans. Theoretical models that consider syndicates as being managed by a single

<sup>7</sup> We also exclude two observations, interpreted as outliers, that report a total of 188 and 56 co-agents, respectively.

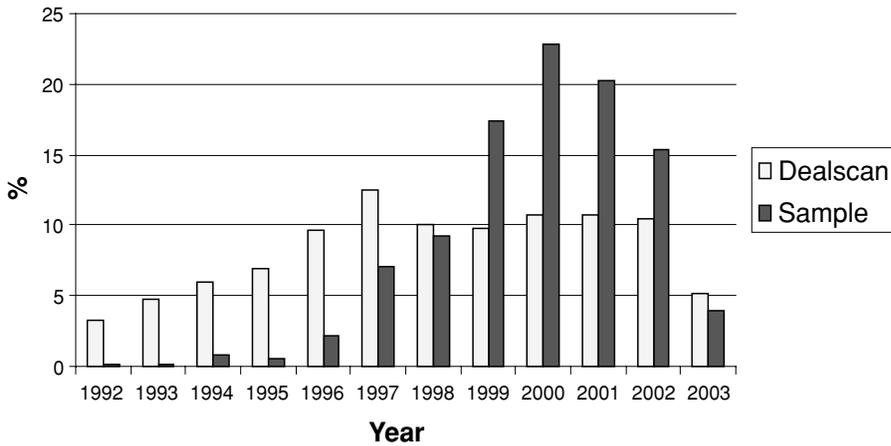


Figure 1

#### Percent of syndicated corporate loans in final sample and full Dealscan database

Each bar represents the percentage of the total sample or database loan count that falls in a given year. The sample ends in June 2003 (incomplete year).

bank (and not a group of banks) therefore fail to capture an important feature of the loan syndication process. Specifically, the number of co-agents varies from zero (the arranger administers the loan by herself) to 38, with a mean value of 6. Co-agents have on average a significant share of the loan (42.55%). But beyond this mean value, the financial participation of co-agents can take on extreme values. The same remark applies to the financial concentration among co-agents (measured by the Herfindahl index).

#### 4.3. The regression models

We test our six implications using three separate ordinary least squares (OLS) regressions, one for each dependent variable (number of co-agents, co-agents' share of the loan, and concentration among co-agents). However, results for the last two regressions (available from the authors) are very similar, so we do not report them. Note that the arranger and the borrower negotiate the terms of the loan *before* the agency structure of the syndicate is set, which rules out endogenous relations between explanatory and dependent variables.

Since the number of co-agents is a count variable, the errors may not be normally distributed and the OLS regression may not be well specified. Therefore a negative binomial regression for the number of co-agents model complements the OLS regression.<sup>8</sup>

<sup>8</sup> A collinearity diagnostic reveals that most correlation coefficients are of moderate magnitude.

Table 2

**Descriptive statistics of 1,181 syndicated corporate loans, 1992–2003**

Co-agents are banks having an administrative task in the syndicate (excluding the leader). Co-agents’ share of the loan is in percentage. Concentration among co-agents (in percentage) is measured by the Herfindahl index of their loan shares. “Fee” (in basis points) is the total fee paid by the borrower (the sum of upfront fees, commitment fees, and annual fees). “Rating” is a dummy variable equal to 1 if the borrower’s S&P’s senior long-term debt rating is investment grade. “Covenants” is the number of financial covenants in the loan. Loan maturity is in months. “Participants” is the number of banks neither leader nor co-agents in the syndicate. “Leader share” is the percentage of the loan held by the leader. Loan size is in \$ million. Firm size is the logarithm of the borrower’s annual sales (in \$ million).

	Mean	Median	S.D.	Min.	Max.
Number of co-agents	6.00	4.00	6.14	0.00	38.00
Co-agents’ share of the loan	42.55	42.22	25.56	0.00	95.37
Concentration among co-agents	39.00	25.98	32.61	2.76	100.00
Fee	100.97	42.50	122.60	0.00	900.00
Rating	0.59	1.00	0.49	0.00	1.00
Covenants	1.80	2.00	0.97	0.00	5.00
Maturity	40.19	36.00	27.03	3.00	301.00
Participants	8.87	7.00	7.81	0.00	106.00
Leader share	18.38	13.33	16.02	0.00	100.00
Loan size	590.64	300.00	982.88	100.00	18,469.00
Firm size	21.60	21.62	1.36	16.57	24.94

## 5. Results

### 5.1. Full sample

The OLS regression results appear in Table 3. Reported *t*-statistics are adjusted for potential heteroskedasticity using White’s (1980) correction. The results for the negative binomial regressions are in Table 4.

All regressions have substantial explanatory power. The OLS-adjusted  $R^2$  is 43%; in the negative binomial regression, the scaled Pearson  $\chi^2$  is 1.14. Robustness checks confirm that the collinearity between the variables “Rating” and “Covenants” does not alter the results in a significant manner.

Four of the six explanatory variables are consistently significant in all of our regressions. Another variable (“Rating”) is occasionally significant. This suggests that most selected variables are important determinants of the agency structure of loan syndicates. We now scrutinize them in greater detail.

*Fees.* We find strong evidence that fees are negatively associated with the extent of delegation in the syndicate. The evidence is especially strong in the negative binomial model. The coefficients for the variable “Fee” are negative, which validates the predictions of the specialization hypothesis. Results, therefore, suggest that co-agents compete in the syndicate to reduce the total cost of managing the loan.

Table 3

**OLS regressions to explain the number of co-agent banks in syndicated corporate loans, 1992–2003**

The dependent variable is the number of banks having an administrative task in the syndicate (excluding the leader). “Fee” (in basis points) is the total fee paid by the borrower (the sum of upfront fees, commitment fees, and annual fees). “Rating” is a dummy variable equal to 1 if the borrower’s S&P’s senior long-term debt rating is investment grade. “Covenants” is the number of financial covenants in the loan. Loan maturity is in months. “Participants” is the number of banks neither leader nor co-agents in the syndicate. “Leader share” is the percentage of the loan held by the leader. Loan size is in \$ million. Firm size is the logarithm of the borrower’s annual sales (in \$ million). Columns 2 and 3 display the coefficient signs predicted by the specialization and the monitoring hypotheses, respectively. Coefficients of dummy variables for loan purpose, industry, and year effects are omitted. *t*-statistics are in parentheses.

	Hypotheses predicted sign		Regressions			
	Specialization	Monitoring	(1)	(2)	(3)	(4)
Intercept			−13.199*** (−4.113)	−13.298*** (−4.142)	−13.891*** (−4.505)	−13.668*** (−4.435)
Fee	−	?	−0.003** (−2.208)	−0.002* (−1.705)	−0.003** (−2.245)	−0.002* (−1.783)
Rating	?	−	−0.613* (−1.676)		−0.549 (−1.540)	
Covenants	+	−	−0.135 (−0.780)	−0.069 (−0.412)		
Maturity	−	+	0.034*** (5.657)	0.036*** (5.933)	0.034*** (5.606)	0.035*** (5.977)
Participants	?	+	−0.176*** (−8.941)	−0.173*** (−8.820)	−0.178*** (−9.158)	−0.174*** (−9.030)
Leader share	?	−	−0.124*** (−13.463)	−0.123*** (−13.358)	−0.124*** (−13.444)	−0.123*** (−13.361)
Loan size			0.003*** (16.001)	0.003*** (15.929)	0.003*** (16.086)	0.003*** (16.012)
Firm size			1.020*** (7.666)	0.995*** (7.521)	1.041*** (7.986)	1.008*** (7.835)
Adjusted <i>R</i> <sup>2</sup>			43.0%	42.9%	43.0%	42.9%
<i>F</i> -statistic			30.669***	31.580***	31.716***	32.725***

\*\*\*Indicates statistical significance at the 0.01 level.

\*\*Indicates statistical significance at the 0.05 level.

\*Indicates statistical significance at the 0.1 level.

*Borrower’s rating.* The variable “Rating” is significant in two regressions (Tables 3 and 4) at the 10% level only. This is weak evidence for the monitoring hypothesis, suggesting that loans with a risky borrower need to rely on more co-agents to mitigate informational asymmetries between the lead arranger and the borrower.

*Covenants.* The coefficient for the variable “Covenants” is never significant.<sup>9</sup> Contrary to Dichev and Skinner’s (2002) results, financial covenants do not seem to act as

<sup>9</sup>We only find one significant (at the 10% confidence level) and positive coefficient for the variable “Covenant” in the co-agents’ share of the loan model (not reported). This result weakly supports the specialization hypothesis. Consistent with Viswanath and Eastman (2003), it indicates that the number of covenants increases the deal implementation costs that are split by additional co-agents.

Table 4

**Negative binomial regressions to explain the number of co-agent banks in syndicated corporate loans, 1992–2003**

The dependent variable is the number of banks having an administrative task in the syndicate (excluding the leader). “Fee” (in basis points) is the total fee paid by the borrower (the sum of upfront fees, commitment fees, and annual fees). “Rating” is a dummy variable equal to 1 if the borrower’s S&P’s senior long-term debt rating is investment grade. “Covenants” is the number of financial covenants in the loan. Loan maturity is in months. “Participants” is the number of banks neither leader nor co-agents in the syndicate. “Leader share” is the percentage of the loan held by the leader. Loan size is in \$ million. Firm size is the logarithm of the borrower’s annual sales (in \$ million). Coefficients of dummy variables for loan purpose, industry, and year effects are omitted. Chi-square statistics are in parentheses.

	Hypotheses predicted sign		Regressions			
	Specialization	Monitoring	(1)	(2)	(3)	(4)
Intercept			-0.8237* (2.93)	-0.8637* (3.23)	-0.8092* (3.04)	-0.8091* (3.04)
Fee	-	?	-0.0007*** (9.18)	-0.0005*** (6.83)	-0.0007*** (9.18)	-0.0005*** (6.64)
Rating	?	-	-0.0966 (2.65)		-0.0979* (2.82)	
Covenants	+	-	0.0031 (0.01)	0.0117 (0.19)		
Maturity	-	+	0.0047*** (24.32)	0.0050*** (27.49)	0.0047*** (25.23)	0.0051*** (29.66)
Participants	?	+	-0.0243*** (55.88)	-0.0238*** (53.78)	-0.0243*** (57.30)	-0.0235*** (54.66)
Leader share	?	-	-0.0322*** (276.92)	-0.0319*** (274.32)	-0.0322*** (277.32)	-0.0320*** (274.66)
Loan size			0.0003*** (89.31)	0.0003*** (88.18)	0.0003*** (89.49)	0.0003*** (88.14)
Firm size			0.1525*** (59.27)	0.1498*** (57.56)	0.1520*** (61.75)	0.1478*** (59.31)
Scaled deviance			1.1605	1.1602	1.1595	1.1594
Scaled Pearson $\chi^2$			1.1445	1.1457	1.1431	1.1433

Scaled deviance and scaled Pearson  $\chi^2$  are used to detect over- or underdispersion in the regression. Their values close to one indicate an adequate goodness of fit.

\*\*\*Indicates statistical significance at the 0.01 level.

\*Indicates statistical significance at the 0.1 level.

a device to mitigate agency problems in syndicated loans. However, one should keep in mind that our variable is the number of covenants. It is therefore an imperfect proxy for implementation costs as well as for monitoring effects, which are both influenced by the tightness of covenants.

*Loan maturity.* Our results provide very strong evidence that loan maturity is positively correlated with delegation in the syndicate. The coefficients for the variable “Maturity” are all significant at the 1% level in all regressions (see Tables 3 and 4). Their signs are always consistent with the monitoring hypothesis. Agency theory suggests that longer loans are riskier and more loosely monitored.

A stronger participation of co-agents is required to handle agency conflicts with these loans.

*Number of participants.* The coefficients for the variable “Participants” are all significant at the 1% level in all regressions (see Tables 3 and 4). There is a strong negative relation between the number of co-agents and the number of participants. This finding contradicts the monitoring hypothesis. We interpret it as a simple mechanical relation. For a given number of banks involved in the syndicate, and given that the roles of co-agent and participant are exclusive, more participants leave less room for co-agents.

*Leader’s share.* We find very strong evidence of a negative relation between delegation and the share of the leader. The coefficients for the variable “Leader share” are all significant at the 1% level in all regressions (see Tables 3 and 4). This result strongly supports the monitoring hypothesis. When the leader has a high stake in the loan, his interests are more aligned with those of the participating members. Hence, the leader does not need to rely on additional co-agents to mitigate agency problems.

Overall, our findings support both hypotheses. Regarding the specialization hypothesis, two predictions (related to the variables “Fees” and “Participants”) are strongly confirmed. In addition, one prediction (related to the variable “Maturity”) is strongly rejected. Regarding the monitoring hypothesis, two predictions (related to the variables “Maturity” and “Leader share”) are strongly confirmed. Another prediction (related to “Rating”) is weakly confirmed. In addition, one prediction (related to the variable “Participants”) is strongly rejected.

A potential explanation for these mixed results is that the specialization and the monitoring hypotheses are not exclusive. For a given loan, the lead arranger could select co-agents for cost splitting *and* monitoring purposes. Another explanation is that some loans may be more costly to manage and co-agents’ specialization is more necessary. Other loans may be subject to higher informational asymmetries, making monitoring the main reason for co-agents. We investigate the latter explanation in section 5.2.

## 5.2. Results for subsamples

The analysis now focuses on the four subsamples containing the two extreme quartiles of loan amount and loan maturity. We report OLS regression results in Table 5.

Due to the presence of fixed costs, small loans are more expensive to manage. Hence, specialization effects should be more pronounced. Furthermore, the stakes of agency conflicts should increase with the loan size. Monitoring effects should therefore be stronger. Table 5 reports that the negative coefficient for the variable “Fee” is no longer significant and the negative coefficient for the variable “Rating” becomes significant when it comes to big loans. Panyagometh and Roberts (2002) argue that lead banks do not seem to act as if they benefit from private information

Table 5

**OLS regressions on subsamples: Effects of loan size and maturity**

The four subsamples consist of the first and last quartiles of loan size and the first and last quartiles of loan maturity, respectively. The dependent variable is the number of banks having an administrative task in the syndicate (excluding the leader). “Fee” (in basis points) is the total fee paid by the borrower (the sum of upfront fees, commitment fees, and annual fees). “Rating” is a dummy variable equal to 1 if the borrower’s S&P’s senior long-term debt rating is investment grade. “Covenants” is the number of financial covenants in the loan. Loan maturity is in months. “Participants” is the number of banks neither leader nor co-agents in the syndicate. “Leader share” is the percentage of the loan held by the leader. Loan size is in \$ million. Firm size is the logarithm of the borrower’s annual sales (in \$ million). Coefficients of dummy variables for loan purpose, industry, and year effects are omitted. *t*-statistics are in parentheses.

	Hypotheses predicted sign		Loan size		Loan maturity	
	Specialization	Monitoring	Smallest	Biggest	Shortest	Longest
Intercept			-5.883 (-0.682)	-12.099** (-2.250)	-8.770 (-1.228)	-28.732*** (-3.959)
Fee	-	?	-0.010* (-1.963)	-0.001 (-0.893)	0.007 (1.483)	0.001 (0.364)
Rating	?	-	-1.072 (-0.875)	-1.135** (-2.120)	1.931** (2.192)	-3.075*** (-3.878)
Covenants	+	-	0.851 (1.417)	-0.210 (-0.872)	0.050 (0.122)	-0.608* (-1.852)
Maturity	-	+	0.084*** (4.547)	0.006 (0.768)	0.231 (1.286)	0.007 (0.453)
Participants	?	+	-0.313*** (-7.197)	-0.091** (-2.282)	-0.230*** (-4.520)	-0.128*** (-4.358)
Leader share	?	-	-0.231*** (-7.358)	-0.073*** (-5.467)	-0.162*** (-6.422)	-0.080*** (-4.652)
Loan size			0.003*** (7.108)	-0.005 (-0.740)	0.003*** (9.446)	0.004*** (7.462)
Firm size			0.849** (2.285)	0.975*** (4.540)	0.436 (1.557)	1.753*** (5.977)
Adjusted R <sup>2</sup>			41.2%	22.4%	40.2%	51.8%
F-statistic			8.344***	4.034***	8.315***	12.725***

\*\*\*Indicates statistical significance at the 0.01 level.

\*\*Indicates statistical significance at the 0.05 level.

\*Indicates statistical significance at the 0.1 level.

about the borrower’s credit quality, thereby denying the adverse selection problem that could be associated with loan syndication. One should note, however, that their sample contains, on average, smaller loans (mean facility is \$132 million compared to \$591 million in our sample). Their conclusion regarding the absence of agency effect is therefore partly driven by a sample bias.

We also expect long-term loans to be more subject to monitoring effects and less subject to specialization effects. This is confirmed in Table 5. The positive coefficient for “Rating” becomes negative as we move from short- to long-term loans. Also, the coefficient for “Covenant” is significant and negative only for long-term loans.

### 5.3. Associations in the syndication process

Another direction for explaining the mixed results about the specialization and the monitoring hypotheses is to investigate the associations among banks in the syndication process. In this subsection, we investigate if identical leaders and co-agents are involved in the same syndicates. We repeat the investigation for leaders and participants.

A  $\chi^2$  test determines if the identity of the leader affects the occurrence of banks acting as co-agents. Specifically, we compare the unconditional distribution of co-agents across loans with the same distribution conditional on bank  $L$  being the leader. Let  $N$  denote the total number of loans involving  $N_B$  banks. Let  $N_C$  denote the total number of co-agent roles played by bank  $C$ . The unconditional probability of bank  $C$  acting as a co-agent is  $N_C/N$ . Suppose bank  $L$  is the leader in  $N_L$  loans. Within these  $N_L$  loans, bank  $C$  is a co-agent in  $N_{CL}$  loans. The conditional probability of bank  $C$  acting as a co-agent in a loan led by bank  $L$  is  $N_{CL}/N_L$ .

The bias in leader  $L$ 's co-agent selection is measured by the  $\chi^2$  distance between the conditional and the unconditional distributions given by

$$D_{\chi^2} = \sum_1^{N_B-1} \frac{\left( \frac{N_{CL}}{N_L} - \frac{N_C}{N} \right)^2}{\frac{N_C}{N}}.$$

Under the null hypothesis that the two distributions are the same, the law of the variable  $N_L \cdot D_{\chi^2}$  converges to a  $\chi^2$  distribution with  $N_B - 1$  degrees of freedom as  $N_L$  goes to infinity.

Since the market for leading syndicates is strongly oligopolistic, we need to restrict our sample to loans led by the top three lead banks to maintain the validity of the asymptotic test (all these arrangers lead at least a hundred loans in our sample). We get a total of  $N = 672$  loans (57% of the 1,181 initial observations) that involve  $N_B = 192$  different co-agents. The top three leaders are JP Morgan (321 leads), Bank of America (195 leads), and Citigroup (156 leads).<sup>10</sup> We repeat the procedure to test if leaders are biased when selecting participants. The total 672 loans involve  $N_B = 554$  different participants. The results are in Table 6.

First, we find strong evidence that co-agents are not uniformly distributed across top leaders. For all top three leaders, the conditional probability of being a co-agent is statistically different from the unconditional probability. This result indicates that leaders tend to work with specific co-agents. Consistent with the specialization hypothesis, leaders do not randomly select co-agents but rather choose those whose administrative skills are complementary. Also, this finding limits the importance of

<sup>10</sup> This oligopoly is not a bias in our sample. According to Dealscan, the average market share for syndication lead over the 1999–2003 period of JP Morgan, Bank of America, and Citigroup was 19%, 13%, and 11.5%, respectively.

Table 6

**Chi-square tests for associations in corporate loan syndicates**

The sample contains 672 loans led by the top three leaders of the syndicated loan market between 1992 and 2003. The  $\chi^2$  tests look for differences between the probabilities of banks acting as co-agent (Panel A) or participant (Panel B), conditional on the loan being led by JP Morgan, Bank of America, or Citigroup, and the unconditional probabilities.

	Leader		
	JP Morgan	Bank of America	Citigroup
Chi-square	278.91***	356.07***	518.11***
Degrees of freedom	191	191	191
<i>Panel B: Associations between leader and participants</i>			
Chi-square	929.03***	895.06***	796.57***
Degrees of freedom	553	553	553

\*\*\*Indicates statistical significance at the 0.01 level.

the monitoring effect as participants can interpret the repeated contracting as a risk of collusion between leaders and co-agents.

Second, we find equally strong evidence that participants are not uniformly distributed across arrangers. Rather, we observe that banks cluster their participations around loans led by specific leaders. We interpret the result as evidence that syndicates arise as repeated contracting relations with the same participants. Such repeated contracting relations reduce adverse selection and moral hazard problems between the leader and participants. This explains why our previous analysis finds mixed support for the monitoring hypothesis.

## 6. Conclusion

The process of loan syndication typically involves the participation of co-agents. These banks share administrative tasks with the lead arranger. Hence, their presence can be justified by cost reduction motives. Since they work in collaboration with the leader, co-agents can also have an informational advantage over other members of the syndicate. Their role can therefore consist of mitigating potential agency conflicts between the informed leader and the other members of the syndicate.

We examine the specialization and monitoring hypotheses in explaining the agency structure of loan syndicates. Using the Dealscan database to examine the observable characteristics of the syndicated loans, we find strong evidence for both hypotheses. Thus, the specialization and monitoring effects appear not to be mutually exclusive for the syndicated loans as a group.

Further tests yield deeper insights into the applicability of the two hypotheses. First, the specialization and monitoring effects do not apply for the same loans. A

subsample analysis reveals that co-agents arise for cost-cutting reasons when loans are of short term and small in size. By contrast, co-agents act as delegated monitors when informational conflicts are potentially severe: that is, when loans are long term and large. Second, we find evidence of repeated contracting between leaders and participants and also between leaders and co-agents, which attenuates the monitoring effect.

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