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Competition and Coalition among Underwriters: The Decision to Join a Syndicate

WEI-LING SONG*

ABSTRACT

This paper studies the decision of lead investment banks to organize hybrid syndicates (commercial banks participating as co-managers) versus pure investment bank syndicates. The findings show that hybrid underwriting issues are more challenging to float. Compared to pure investment bank syndicates, hybrid syndicates serve clients that are smaller, have lower common stock rankings and less prior access to the capital markets, rely more on bank loans, and invest less capital but issue larger amounts, which indicates that commercial banks' participation enhances hybrid services. Moreover, lead investment banks tend to invite banks' participation when clients exhibit higher loyalty in reusing their services.

THIS PAPER UTILIZES A UNIQUE opportunity created by the Federal Reserve Board to empirically examine the economics of syndicate formation. In 1989, the Board granted five commercial banks permission to underwrite corporate bonds through the so-called "Section 20 Subsidiaries" (Federal Reserve (1989)). During the process of repealing the Glass–Steagall Act, which separated commercial banking and investment banking in the United States, incumbent investment banks (IB) were the major opponents of the repeal. Although investment banks have competed fiercely with entrant commercial banks (CB) in the legislative arena, commercial banks' entry into security underwriting has been accommodated to some extent. Cooperative arrangements between these two types of underwriters accounted for nearly one-third of corporate bond underwriting in 1996.

Why would lead investment banks invite commercial banks to join the syndicates as co-managers? In particular, in the early bank entry stage, why did investment banks not compete more aggressively by excluding commercial banks from the syndicates? If commercial banks do not provide additional functions

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compared to other investment banks in enhancing underwriting services, would it not be more rational for lead investment banks to cooperate with other investment bank “friends” and leave commercial bank “rivals” out of the circle? To answer these questions, this study tests a service enhancement hypothesis that the motives to improve underwriting services drive the coalitions between rival underwriters. Besides that, whether or not commercial banks differ from investment banks in providing underwriting functions is also an important policy question that much theoretical and empirical work tries to answer.

The differences between commercial banks and investment banks at the lead underwriter level have been discussed extensively in prior literature.¹ Commercial banks’ dual roles as lenders and underwriters enhance information efficiency and financing flexibility. However, the better certification ability is offset by the potential for conflicts of interest. Instead of granting new loans, banks could underwrite for poor firms. Furthermore, as entrants, commercial banks are less effective in distributing large issues. Nonetheless, it is an empirical question whether such information and financing advantages enhance the underwriting services of investment bank lead syndicates when commercial banks play a junior role as co-managers. In addition, can lead investment banks mitigate bank co-managers’ conflicts of interest?

Several theoretical studies have examined the rationales for coalitions among investment bankers. These studies suggest that the decisions to form syndicates are driven by the motivations to minimize the information free-riding problem and to enhance information production. Anand and Galetovic (2000) argue that when information produced by investment banks is nonexcludable (the action to underwrite for a firm provides information that cannot be excluded from other underwriters), cooperation between firms may be necessary for the market to exist. Bhattacharyya and Nanda (2000) show that an asymmetric distribution of market shares tends to enhance financial innovation activity, not only because the large bank has greater incentives to innovate but also because it is the natural partner for the smaller banks in cooperative arrangements. Pichler and Wilhelm (2001) contend that the economic functions of syndicate formation are to provide a monitoring role for the lead underwriter and to mitigate the moral hazard problem of information production. In this paper, I empirically provide an additional rationale for syndicate formation; that is, underwriters with complementary abilities can cooperate to enhance their services that fill the special needs of certain clients.

The cooperative arrangement in which an investment bank is the lead manager and commercial banks participate as co-managers is defined as a hybrid syndicate in this paper. If commercial banks are not different from investment banks as co-managers, then compared to pure investment bank (pure-IB) syndicates, hybrid syndicates will not serve different clienteles and the bond prices will not have systematic differences because both syndicates are lead-managed by investment banks. Moreover, can the coalitions between different

¹ See Ang and Richardson (1994), Puri (1994), Puri (1996), Gande et al. (1997), Song (2003), and Roten and Mullineaux (2002) for prior empirical results in bank underwriting.

underwriters with complementary abilities create synergies and provide better services for some clients? This study also addresses the question of whether the reputation and the distribution network of lead investment banks can mitigate the conflicts of interest and the distribution disadvantage of commercial banks and yield higher bond prices for hybrid clients.

To test this service enhancement hypothesis, I use a switching simultaneous-equations model described in Maddala (1983, p. 282). The unique feature of this empirical model is that it permits the analysis of both exogenous and endogenous factors affecting syndicate formation. It also allows the evaluation of resulting underwriting services while recognizing that the observed syndicate distributions are not random. This is the so-called endogenous switching problem.

Using a sample of 2,345 nonconvertible corporate bond issues from 1991 to 1996, I compare the clienteles of bonds underwritten by three forms of syndicate structures: Hybrid, CB-lead, and pure-IB syndicates.² I also examine their clients' bond pricing (underwriting technologies). The sample ends in 1996 because after the increase of the revenue limitation imposed only on commercial banks to 25% at the end of 1996, there are many high profile mergers between lead underwriters of different types (Song and Goldberg (2002)). Thus, the bond underwriting performance of different entities is less distinct. Therefore, the period from 1991 to 1996 provides a precious sample that makes the test of the service enhancement hypothesis possible.

The findings indicate that the clienteles among these three syndicates are very different. Compared to pure-IB syndicates, hybrid syndicates tend to underwrite for firms that are smaller, have lower common stock rankings and less prior access to the capital markets, rely more on bank loans, and invest less capital but issue larger amounts. It appears that these issues are more difficult to underwrite. These results suggest that hybrid clients are special and that lead investment banks can enhance underwriting services by inviting commercial banks to join the syndicates, which in turn permits hybrid syndicates to engage in the more challenging market segments and enhance hybrid clients' access to the public debt market. Despite the benefit of service enhancement, lead investment banks choose to invite banks' participation when the clients exhibit higher loyalty in reusing their underwriting services. The results on endogenous selection controls also indicate that lead investment banks are the dominant players in determining syndicate formation.

In contrast to CB-lead syndicates, hybrid syndicates underwrite more issues with the purpose of repaying bank debt and without common stock rankings. Hybrid clients do not suffer from price discounts when interest expenses increase, regardless of issuing purpose or borrowing from the bank co-managers. The opposite is true for CB-lead clients. These findings indicate that lead

² Commercial bank lead syndicates may or may not have other investment banks or commercial banks participate as co-managers. These data are lumped in the CB-lead syndicates because the sample size for pure commercial bank syndicates (only 2.2% of the sample) is too small to conduct multivariate analysis as a separate category.

investment banks could alleviate the bank co-managers' conflicts of interest in the hybrid syndicates.

The evidence supports the proposition that enhancing service is the motive driving coalitions between rival underwriters. Apart from the focus on lead investment banks, this paper demonstrates that even if the lead investment bank is the same, different syndicate memberships provide different underwriting functions to fill the special needs of clients for a particular bond issue. However, it is the lead investment banks that primarily decide whether or not to include commercial banks in the syndicates.

The remainder of the paper is organized as follows. Section I discusses the rationales of coalitions between commercial and investment banks. Section II presents the empirical syndication decisions model. Section III describes the data and summary statistics. Section IV presents the results of syndication decisions and the impact of such decisions on clients' bond prices. Finally, Section V concludes the paper.

I. The Rationales for Coalitions among Underwriters

A. The Service Enhancement Hypothesis

Fama (1985) contends that commercial banks possess informational advantages over outsiders due to their loan monitoring and transactional activities with clients. Association with commercial banks also provides clients with better financing opportunities in the future (see, for e.g., Holland (1994), James (1987)). Because of the combined lending and underwriting, commercial banks provide better certification function than investment banks.³ However, an investment bank is more credible than a commercial bank in certifying a bond issued to repay bank debt, due to the investment bank's independent third-party role. Kanatas and Qi (1998) demonstrate that the incentive conflict of integrated intermediaries may impose a cost on their customers seeking to raise capital. They also find that when both the cost of the incentive conflict and the savings from economies of scope are sufficiently large, there is a role for reputation building in mitigating the incentive conflict problem. This suggests that the separation of lending and underwriting can arise endogenously. Empirical studies, such as Kroszner and Rajan (1997) and Gompers and Lerner (1999), provide evidence of an endogenously derived intermediary structure to reduce the conflicts of interest. The formation of hybrid syndicates, which combines the complementary abilities of different underwriters, may provide a new breed of underwriting that serves a clientele different from that of pure-IB syndicates. I test this proposition as the service enhancement hypothesis.

The enhanced certification function may allow hybrid syndicates to underwrite for firms with more information problems or for those in need of more flexible financing, such as small and high growth (Tobin's q) firms, new issues,

³ Drucker and Puri (2002) study the lending practices of underwriters around the time of equity issuance. Although both investment banks and commercial banks engage in such tying arrangements, tied deals are found in only 2% of seasoned equity offerings from 1994 to 1996.

and firms that have less access to the capital markets prior to the usage of hybrid syndicates. On the other hand, the reputation of lead investment banks may permit hybrid syndicates to better serve clients raising capital to refinance bank debt than CB-lead syndicates may be able to. The proxies for conflicts of interest are the issue purpose of repaying bank debt, and its interaction with interest expense and with underwriter lending relationship (underwriter loans). Finally, commercial banks can engage in the large issue markets by participating in the hybrid syndicates. The proxy for distribution ability is issue size. The definition of each proxy variable is listed in the relevant tables.

B. The Control for Clients' Prior Securities Issuances and Underwriter-Client Relationships

Because of information asymmetry, participants in the capital markets tend to develop long-term relationships to solve the problem (see Stiglitz and Weiss (1983)). Empirical research also finds that ongoing relationships have profound effects on the behavior of intermediaries and the consequence of intermediary services.⁴ For example, Krigman, Shaw, and Womack (2001) study the usage of underwriter services and find that IPO (initial public offering) clients that switch to different underwriters for subsequent SEOs (seasoned equity offerings) raise fewer proceeds than expected, while nonswitchers raise significantly larger amounts.

If hybrid clients are those requiring increased access to capital markets, then hybrid clients tend to use the same lead investment banks. Besides, a lead investment bank may be concerned with the potential for commercial banks to develop relationships with the client through the opportunity of co-managing the bond issuance, and thus tends to organize a hybrid syndicate for a more loyal client. These arguments posit a positive relation between forming a hybrid syndicate and reusing lead underwriters' services. In addition, reusing underwriters' services can lower the costs of information production and enhance the certification of underwriting services that can also lower the costs of new bond issuance. Prior capital market access is proxied by the total amounts of bond issuances and the number of equity issuances within the 3-year period prior to the current bond issuance. Dummy variables indicating if the client has used the same lead underwriter in the past bond or equity issuances are also included.

II. Empirical Syndicate Formation Model

If coalition between investment and commercial banks is driven by mutual benefits that enhance underwriting services for certain clients, we should observe higher bond prices conditional on the hybrid syndicate formation. Since

⁴ The author is grateful to an anonymous referee for suggesting this fruitful direction for research.

there are two syndication decisions—one for investment banks, the other for commercial banks—to determine the formation of hybrid syndicates, the observed distribution of hybrid clients can be censored by those decisions.⁵ Therefore, one should control for these decisions in analyzing bond pricing.

This section presents a switching simultaneous-equations model described in Maddala (1983) to test these syndication decisions and their impact on clients' bond prices.⁶ Formally, the empirical model is as follows:

$$y_{1i} = X_i\beta_1 + u_{1i}, \quad (1)$$

$$y_{2i} = X_i\beta_2 + u_{2i}, \quad (2)$$

$$y_{3i} = X_i\beta_3 + u_{3i}, \quad (3)$$

$$A_i^* = -(Z_{Ai}\gamma_A - \varepsilon_{Ai}), \quad (4)$$

$$B_i^* = -(Z_{Bi}\gamma_B - \varepsilon_{Bi}), \quad (5)$$

where y_i is the net yield of bond for firm i . Subscript 1 refers to the net yield of a bond underwritten by a hybrid syndicate. Therefore, equation (1) describes the underwriting technology for hybrid syndicates. Subscript 2 refers to the net yield of bond underwritten by a pure-IB syndicate. Subscript 3 refers to that underwritten by a CB-lead syndicate. Variables A_i^* and B_i^* are the underlying syndication values, which determine the syndication decisions for investment banks and commercial banks, respectively. Variables X_i , Z_{Ai} , and Z_{Bi} are vectors of exogenous firm and issue characteristics. If $y_{1i} < y_{2i}$, then A_i^* tends to be positive by model specification.⁷ It means that investment banks tend to invite commercial banks to participate in the syndicates, since the bond net yield of firm i would be lower if the hybrid syndicate underwrites for it. By the same token, if $y_{1i} < y_{3i}$, then B_i^* tends to be positive, which means commercial banks tend to join the hybrid syndicates instead of competing for the lead roles.

Because each firm could only choose one type of syndicate to underwrite for each bond issue, we would observe only one net yield of a bond by the selected

⁵ This model is also consistent with the scenario that clients are rational and seeking to match with the syndicates that provide the lowest financing costs, as measured by bond net yields. The selection of three types of syndicates also implicitly considers the underwriter switching issue, because the clients choosing commercial bank lead syndicates or hybrid syndicates are switching from pure investment bank syndicates. Before the bank entry in security underwriting, all clients only have one choice, pure investment bank syndicates.

⁶ The earlier version of this paper also includes underwriting fees. However, adding the analysis of fees does not change the main conclusions of this paper, thus the analysis of underwriting fees is dropped. See Dunbar (1995) for the example of using two factors in the decisions. In addition, Song (2003) shows that net yields rather than fees are the dominant factor in determining underwriter selection at the lead underwriter level.

⁷ Another way to express A_i^* is $A_i^* = -(y_{1i} - y_{2i})$, if net yields are the only determinants of syndicate formation. Equation (4) is a more general way of expressing investment banks' syndication decision.

syndicate. The net yields of firm i using the other two unselected syndicates would not be observed. Therefore,

$$A_i = 1 \text{ iff } A_i^* > 0, \quad (6)$$

$$A_i = 0 \text{ iff } A_i^* \leq 0, \quad (7)$$

$$B_i = 1 \text{ iff } B_i^* > 0, \quad (8)$$

$$B_i = 0 \text{ iff } B_i^* \leq 0, \quad (9)$$

where A_i is a dummy variable taking the value 1 if a lead investment bank invites commercial banks to participate in the syndicate as co-managers that underwrite for firm i , and is 0 otherwise. Similarly, B_i is a dummy variable taking the value 1 if a commercial bank joins the hybrid syndicate that underwrites for firm i , and is 0 otherwise.

The observed net yield y_i is defined as

$$y_i = y_{1i} \text{ iff } A_i = 1 \text{ and } B_i = 1. \quad (10)$$

Equation (10) indicates that one observes the net yield of a bond underwritten by a hybrid syndicate when the lead investment bank invites commercial banks' participation in the syndicate and commercial banks join the syndicate as co-managers. Assuming that all the error terms with mean zero and the correlations between errors are normally distributed and that $\text{Cov}(\varepsilon_A, \varepsilon_B) = 0$, the conditional mean net yield of a hybrid underwriting bond is given by the following:⁸

$$E(y_{1i} | A_i = 1, B_i = 1) = X_i \beta_1 + \sigma_{A1} \frac{\phi(Z_{Ai} \gamma_A)}{1 - \Phi(Z_{Ai} \gamma_A)} + \sigma_{B1} \frac{\phi(Z_{Bi} \gamma_B)}{1 - \Phi(Z_{Bi} \gamma_B)}, \quad (11)$$

where $\phi(\cdot)$ and $\Phi(\cdot)$ are, respectively, the standard normal density and distribution functions. The tests of endogenous selectivity bias arising from syndication decisions are tests for $\sigma_{A1} = 0$ and $\sigma_{B1} = 0$ in equation (11). If hybrid syndicate formation is driven by service enhancing that reduces the net yields of bonds, then σ_{A1} , σ_{B1} , or both should be negative. The coefficient $\sigma_{A1}(\sigma_{B1})$ is the covariance between u_{1i} and ε_{Ai} (u_{1i} and ε_{Bi}). If σ_{A1} is negative, the error term in equation (1) is negatively related to the error term in equation (4). This indicates that the low net yields (low value of u_{1i}) are associated with investment banks inviting the participation of commercial banks (high value of ε_{Ai}). Therefore, a negative estimate of σ_{A1} in equation (11) shows these hybrid clients that lead investment banks can better serve by inviting banks' participation and obtain lower net yields. Moreover, the "better" endogenous syndicate choice implied by

⁸ The economic interpretation of $\text{Cov}(\varepsilon_A, \varepsilon_B)$ being 0 is that both underwriters make syndication decisions independently. There is no interaction between these two decisions.

σ_{A1} is related to investment banks' decision to form hybrid syndicates. In other words, one could infer from the negative estimate of σ_{A1} that a lead investment bank's decision to cooperate with commercial banks is associated with the sorting (switching) of client firms into groups that match the syndicates' strengths, as indicated by lower net yields. Other estimates of endogenous selection terms could be interpreted in a similar fashion.

Likewise, if a lead investment bank decides to exclude commercial banks and firm i chooses pure-IB over CB-lead syndicate, we would observe y_{2i} . The underwriter choice equation between CB-lead versus pure-IB syndicates and the observed y_i are defined as

$$C_i^* = -(Z_{Ci}\gamma_C - \varepsilon_{Ci}), \quad (12)$$

$$y_i = y_{2i} \text{ iff } A_i = 0 \text{ and } C_i = 0. \quad (13)$$

Similarly to A_i^* and B_i^* , C_i^* contains $-(y_{3i} - y_{2i})$ implicitly and C_i is a dummy variable like A_i and B_i . Again, assuming normal distributions, $\text{Cov}(\varepsilon_A, \varepsilon_C) = 0$, and $\text{Cov}(\varepsilon_B, \varepsilon_C) = 0$, the conditional mean net yields of bonds underwritten by pure-IB syndicates are as follows:

$$E(y_{2i} | A_i = 0, C_i = 0) = X_i\beta_2 - \sigma_{A2} \frac{\phi(Z_{Ai}\gamma_A)}{\Phi(Z_{Ai}\gamma_A)} - \sigma_{C2} \frac{\phi(Z_{Ci}\gamma_C)}{\Phi(Z_{Ci}\gamma_C)}. \quad (14)$$

If a commercial bank lead-underwrites the issue—that is, it does not join the hybrid syndicate and firm i also chooses a CB-lead over a pure-IB syndicate—we would observe y_{3i} . The conditional mean net yields of bonds underwritten by CB-lead syndicates are given by the following:

$$E(y_{3i} | B_i = 0, C_i = 1) = X_i\beta_3 - \sigma_{B3} \frac{\phi(Z_{Bi}\gamma_B)}{\Phi(Z_{Bi}\gamma_B)} + \sigma_{C3} \frac{\phi(Z_{Ci}\gamma_C)}{1 - \Phi(Z_{Ci}\gamma_C)}. \quad (15)$$

I use two-stage regressions to estimate the above equations. The decision equations (4), (5), and (12) are estimated by probit regressions. The conditional mean net yield equations (11), (14), and (15) are estimated by OLS regressions. The endogenous selection terms (inverse Mill's ratios, $\frac{\phi(\cdot)}{1 - \Phi(\cdot)}$ or $-\frac{\phi(\cdot)}{\Phi(\cdot)}$) in equations (11), (14), and (15) are estimated from the first-stage probit regressions.

III. Data and Summary Statistics

The sample consists of 2,345 public bond offerings between January 1, 1991 and December 31, 1996. Data after 1996 are not included because the subsequent merger activities among lead underwriters make the differences between commercial banks and investment banks less distinct. Financial companies and utilities are excluded from the sample. I obtain issue characteristics from the U.S. Debt New Issues Database in SDC Platinum, provided by Thomson Financial, and firm characteristics measured at the end of the year prior to bond issuance from COMPUSTAT and CRSP (Center for Research and Security Prices). In order to be included in the analysis, an issuing firm must have

Table I
The Frequency and Percentage of Bond Issues by Year and by Syndicate Type

This table presents total numbers and percentages of bond issues. CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks.

Year	CB-Lead	Hybrid	Pure-IB	Total
	Number of Issues (%)	Number of Issues (%)	Number of Issues (%)	Number of Issues (%)
1991	26 (7.1)	27 (7.4)	312 (85.5)	365 (100)
1992	36 (9.6)	78 (20.7)	263 (69.8)	377 (100)
1993	43 (9.6)	106 (23.6)	300 (66.8)	449 (100)
1994	26 (11.9)	55 (25.2)	137 (62.8)	218 (100)
1995	83 (20.2)	107 (26.0)	221 (53.8)	411 (100)
1996	96 (18.3)	165 (31.4)	264 (50.3)	525 (100)
1991–1996	310 (13.2)	538 (22.9)	1,497 (63.8)	2,345 (100)

data available on SDC Platinum, CRSP, and COMPUSTAT. Loan information as the proxy for lending relationships is collected from the DealScan database of the Loan Pricing Corporation. The amounts of loan deals are aggregated for each bond issue if the issuing date is between loan origination date and loan maturity date. Loans from specific lenders, such as banks with Section 20 subsidiaries (prestigious bank loans) and banks leading or participating in the underwriting syndicates (underwriter loans), are pro-rata based on lenders' share information or loan syndicate sizes, where share information is unavailable.⁹

The frequency and percentage of bond issues by year and by syndicate type during the period 1991 to 1996 are reported in Table I. Over the 6-year period, CB-lead syndicates managed 310 bond issues. There are 538 issues underwritten by the hybrid syndicates. Pure-IB syndicates underwrite 1,497 issues. The underwriting of hybrid syndicates increased dramatically from 7.4% of total bond issues in 1991 to 31.4% in 1996. This increase is at the expense of pure-IB syndicates, which underwrite 85.5% of bond issues in 1991, but only 50.3% in 1996. CB-lead syndicates underwrite 7.1% of bond issues in 1991 and 18.3% in 1996.

⁹ The banks with Section 20 subsidiaries are the largest bank holding companies, such as J.P. Morgan and Citicorp, etc. For a list of these banks, see Gande, Puri, and Saunders (1999).

Table II
The Percentage of Bond Issues by Issue Size and by Syndicate Type

Panel A (B) reports the percentage of bond issues in the small (large) issue market, that is, the issue size is less than (greater than or equal to) 150 million dollars. CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks.

Year	CB-Lead	Hybrid	Pure-IB	Total Number
Panel A: The Percentage of Bond Issues in the Small Issue Market				
1991	10.9	4.2	84.9	192
1992	14.7	9.8	75.5	163
1993	15.8	18.4	65.8	196
1994	16.7	17.5	65.9	126
1995	28.3	17.2	54.5	244
1996	20.6	16.6	62.8	325
1991–1996	18.7	14.3	67.0	1,246
Panel B: The Percentage of Bond Issues in the Large Issue Market				
1991	2.9	11.0	86.1	173
1992	5.6	29.0	65.4	214
1993	4.7	27.7	67.6	253
1994	5.4	35.9	58.7	92
1995	8.4	38.9	52.7	167
1996	14.5	55.5	30.0	200
1991–1996	7.0	32.8	60.2	1,099

Table II reports the percentages of bonds underwritten by different types of syndicates in the small and the large issue markets segmented by the issue size of \$150 million. In the small issue market, CB-lead syndicates manage 18.7% of bond issues, which is more than double the 7% in the large issue market. Conversely, hybrid syndicates lead-manage 14.3% of the bond issues in the small issue market, while they manage 32.8% of the issues in the large issue market.

In addition, as shown in Table II, there is a shift of underwriting activities by commercial banks in 1996 from the small to the large issue market, coinciding with two revenue limitation changes. Effective on November 12, 1996, commercial banks are allowed to exclude the interest earned on the ineligible securities from the 10% revenue limit. This amendment would decrease the quarterly ineligible revenue of some Section 20 subsidiaries by a magnitude ranging from 19% to 79%. Since revenue limitations are calculated over a rolling eight-quarter period, commercial banks that anticipate this change could increase their underwriting activities in 1996 (Federal Reserve (1996a)). Besides, the revenue limitation is lifted from 10% to 25% at the end of 1996 (Federal Reserve (1996b)). Issues managed by CB-lead and by hybrid syndicates in the

small issue market declined in percentage terms from 1995 to 1996, while the opposite occurred in the large issue market.

The pattern of bank entry into different issue size markets is consistent with the findings in Song (2003) that commercial banks show a disadvantage in handling large issues. Considering bond issues by hybrid and by CB-lead syndicates together, commercial banks are actively engaged in the large issue market. However, it is mainly by cooperating with an investment bank that may have a better distribution network and that is not restricted by the 10% revenue limitation imposed on commercial banks. It also appears that investment banks choose to cooperate with commercial banks and to accommodate entry rather than to deter it.

Table III documents the paired comparisons in issue characteristics and clients' prior securities issuance between hybrid and CB-lead syndicates, as well as between hybrid and pure-IB syndicates. Hybrid syndicates differ significantly from both CB-lead and pure-IB syndicates in all the issue characteristics presented in the table. Issues underwritten by hybrid syndicates have the largest issue size, highest net yields, highest underwriting fees, largest syndicate size, and longest maturity. The results strongly support the argument that commercial banks play a different role as co-managers than investment banks do, which causes hybrid syndicates to be so distinct in clientele.

Table III also shows that, conditional on clients having issued securities within the 3-year period prior to the current bond issuance, the differences among syndicates in equity issuance are less distinct than those in bond issuance. The median frequency of prior equity issuance and the median number of different lead underwriters used is 1 for all syndicates.

As to past bond issuance, the mean frequency is 7.5 for pure-IB clients, followed by 6.2 for hybrid clients, then by 4.94 for CB-lead clients. The same pattern repeats in the number of different lead underwriters used in prior bond issuance. On average, bond issuers have multiple underwriter relationships. The mean is 2.09 for CB-lead clients, 2.45 for hybrid clients, and 2.85 for pure-IB clients. However, these numbers are not significantly different for the pairwise comparison with hybrid syndicates. The numbers for the total amount of prior bond issuance are significantly different and show the same pattern.

The log transformation of frequency and the total amount of prior bond issuance are not conditional on whether clients have issued bonds in the past. Therefore, the numbers for those that do not issue bonds during the prior 3-year period are set to be zero. The same pattern persists, but the differences between hybrid and CB-lead syndicates are less pronounced.

The lower frequency of bond issuances and issue amounts of hybrid clients, compared to those of pure-IB clients, seem to indicate that hybrid clients have less prior access to the public debt market prior to their usage of the hybrid syndicate. However, the use of hybrid syndicates for current bond issuance permits them to increase the issue size.

Table IV presents the issuing firm characteristics. Consistent with Diamond's (1991) notion that firms need to build a track record before they can borrow from the public debt market, the age of issuing firms is very old. The mean

Table III
Descriptive Statistics of Bond Issue and Clients' Prior Securities Issuance by Syndicate Type

This table compares mean and median bond issue characteristics for issues underwritten by hybrid syndicates to those by CB-lead (pure-IB) syndicates with the test significance level reported under the heading "CB-Lead" ("Pure-IB"). CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks. Net yield is the premium of the ex ante yield spread of a bond over the ex ante yield of a U.S. Treasury security of similar maturity. Underwriting fee is dollars charged for each \$1,000 of bond issue, including management fee, underwriting fee, and selling concession. Syndicate size is the number of underwriters, including lead and co-managers, in a syndicate. Total amount of prior 3-year bond (equity) issuance is the aggregate amount of bonds (equity) in million dollars issued within the 3-year period prior to the current bond issuance. When mean and median of a variable are reported, the difference between two types of underwriters in means is tested by a *t*-test and the difference in medians is tested by a Wilcoxon rank-sum test.

Variable	CB-Lead			Hybrid			Pure-IB		
	Obs	Mean	Median	Obs	Mean	Median	Obs	Mean	Median
Issue size (\$MM)	310	86.6**	50.0***	538	208.4	175.0	1,497	149.8***	100.0***
Net yield (basis point spread)	246	117.7***	71.5***	516	144.9	90.0	1,195	132.6*	84.0***
Underwriting fee (\$/1,000)	186	9.6	6.5***	522	10.4	6.8	1,170	9.4***	6.5***
Syndicate size (number of underwriters)	310	1.8***	1.0***	538	3.6	3.0	1,497	2.0***	2.0***
Maturity of issue (years)	310	10.3***	10.0***	538	15.0	10.0	1,497	13.3***	10.0***
Frequency of prior 3-yr bond issuance	222	4.94	3	346	6.20	4	1,199	7.50	5
Total amount of prior 3-yr bond issuance	222	563.9***	250***	346	1,013	550	1,199	1211.5***	660**
Ln (Frequency of prior bond issuance)	310	1.09	1.10	538	1.07	1.10	1,497	1.46***	1.39***
Ln (Total amount of prior bond issuance)	310	3.97	5.02*	538	4.05	5.30	1,497	5.18***	6.11***
Number of different lead underwriters used in prior 3-yr bond issuance	222	2.09	2	346	2.45	2	1,199	2.85	2
Frequency of prior 3-yr equity issuance	87	1.31	1	163	1.34	1	327	1.31	1
Total amount of prior 3-yr equity issuance	87	251.9	248.8	163	295.4	190	327	380.9**	195
Ln (Frequency of prior equity issuance)	310	0.23	0	538	0.25	0	1,497	0.18***	0***
Number of different lead underwriters used in prior 3-yr equity issuance	87	1.15	1	163	1.19	1	327	1.16	1

*, **, and *** indicate significance at the 10, 5, and 1% levels, respectively, for a two-tailed test.

Table IV
Descriptive Statistics of Issuing Firm Characteristics by Syndicate Type

This table compares mean and median firm characteristics of bond issuers underwritten by hybrid syndicates to those by CB-lead (pure-IB) syndicates, with the test significance level reported under the heading "CB-Lead" ("Pure-IB"). CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks. Age of firms is the number of years since the first date that the data are available from CRSP. Total loans are existing loans borrowed from all banks. Prestigious bank loans are existing loans borrowed from banks with Section 20 subsidiaries. Underwriter loans are existing loans borrowed from the commercial banks that lead or participate as co-managers in the underwriting syndicates. Tobin's q is the book value of debt plus market value of equity divided by total assets. Op. Inc. stands for operating income. TA stands for total assets. When the mean and median of a variable are reported, the difference between two types of underwriters in means is tested by a t -test and the difference in medians is tested by a Wilcoxon rank-sum test.

	CB-Lead		Hybrid		Pure-IB	
	Mean	Median	Mean	Median	Mean	Median
Age of firms (years)	32.88	28.72	31.42	26.41	34.46***	29.90***
Equity market value (\$bn)	5.58***	2.46**	8.02	3.11	11.9***	5.10***
Total loans (\$MM)	773***	106***	2,170	985	1,750**	80***
Prestigious bank loans (\$MM)	476***	40***	1,260	536	999**	0***
Underwriter loans (\$MM)	84.4***	0***	191	52.8	—	—
Capital expenditure/TA*100	7.60	6.47	8.14	6.79	8.97***	7.95***
Interest expense/Op.Inc.*100	22.94	15.35*	25.23	17.55	27.03	18.63
Tobin's q	1.20	0.97	1.16	1.01	1.21	1.04
Cash/TA*100	3.36***	1.85**	4.26	2.51	3.95	1.83***
Op. Inc./TA*100	14.70	14.21	14.88	14.28	14.68	15.28
Total debt/TA*100	32.51*	29.81**	34.60	32.14	35.35	33.13*
Total observations	310	—	538	—	1,497	—

*, **, and *** indicate significance at the 10, 5, and 1% levels, respectively, for a two-tailed test.

Table V
Frequency of Bond Issue Characteristics by Syndicate Type

This table compares the frequency of issue or firm characteristics of clients using hybrid syndicates to those using CB-lead (pure-IB) syndicates, with the test significance level reported under the heading “CB-Lead” (“Pure-IB”). CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks. Use same IPO underwriter indicates a client used the current lead underwriter for its initial public offering. Issue to refinance bank debt indicates the purpose of bond issuance is to refinance bank debt. New issue (a debt IPO) indicates there is no bond issuance within 20 years prior to the current bond issuance. Noninvestment grade indicates the Moody’s credit rating is Ba or lower or nonrated. The difference in percentage is tested by a z-statistic with the null hypothesis that the proportions of particular issuer characteristic between syndicates are the same.

	CB-Lead		Hybrid		Pure-IB	
	Number	%	Number	%	Number	%
Use same lead underwriter in prior 3-yr bond issuance	108	34.8***	243	45.2	843	56.3***
Use same lead underwriter in prior 3-yr equity issuance	6	1.9***	91	16.9	120	8.0***
Use same IPO underwriter	1	0.3***	33	6.1	84	5.6
NYSE-listed firm	276	89.0	490	91.1	1,326	88.6
Issue to refinance bank debt	54	17.4***	186	34.6	343	22.9***
New issue	41	13.2**	103	19.1	153	10.2***
Noninvestment grade	50	16.1***	139	25.8	211	14.1***
S&P stock rankings: 7–9	82	26.5	133	24.7	589	39.4***
S&P stock rankings: 16–18	149	48.1**	219	40.7	502	33.5***
S&P stock rankings: 21–22	12	3.9	12	2.2	44	2.9
S&P stock rankings: nonrated	67	21.6***	174	32.3	362	24.2***
Total observations	310	–	538	–	1,497	–

*, **, and *** indicate significance at the 10, 5, and 1% levels, respectively, for a two-tailed test.

age of client firms (measured since the first date that the data are available from CRSP) for all syndicates is above 30 years, with pure-IB clients being the oldest. Because the control of firm age does not change the findings, I did not add this variable to the regression analysis. In terms of firm size, pure-IB clients are the largest, followed by hybrid clients, then by CB-lead clients. However, hybrid clients have the largest loan amounts regardless of loan types. Pure-IB clients invest significantly more capital, have lower cash, and higher leverage compared to hybrid clients. Compared to CB-lead clients, hybrid clients have higher interest expense, leverage, and cash holdings.

Table V reports the frequency of selective issue characteristics. It shows that only 1.9% of CB-lead clients use the same lead underwriters in the prior equity issuance within 3 years. That of hybrid clients is 16.9%, which is significantly larger than the 8% of pure-IB clients. Consistent with the regulation restriction, CB-lead clients also use the same lead underwriters for their prior bond issuance least frequently with a percentage of 34.8, followed by hybrid clients

(45.2%), and then by pure-IB clients (56.3%). Since most of the firms with public debt access are relatively mature, very few IPO underwriters could be identified in the New Issues Database of SDC Platinum. Around 6% of hybrid and pure-IB clients are found to use the same IPO underwriters.

Table V also shows that hybrid syndicates underwrite the highest percentage of new issues, issues for the purpose of refinancing bank debt, and noninvestment grade bonds.¹⁰ Pure-IB syndicates serve the highest percentage (39.4) of clients with high S&P stock rankings (7–9), but the lowest percentage (33.5) of clients with middle stock rankings (16–18). Among the CB-lead clients, 48.1% of them have middle stock rankings, which is the highest among different syndicates. Hybrid syndicates have the highest percentage (32.3) of clients without common stock rankings, which is consistent with the notion that hybrid clients have a higher level of information asymmetry. There is no difference among syndicates in terms of NYSE listing.

IV. Syndicate Formation and Its Impacts on Client Firms

A. The Clienteles of Different Syndicates

Table VI presents the probit analyses of the underwriters' syndication decisions. The results reported under the heading "Hybrid vs. Pure-IB" represent the syndication decision of investment banks. The dependent variable, hybrid, is 1 if an investment bank invites commercial banks' participation in the syndicate, and is 0 otherwise. Therefore, I use the subsample of bond issues underwritten by hybrid and by pure-IB syndicates to estimate investment banks' syndication decision. The syndication decision of commercial banks (under the heading "Hybrid vs. CB-Lead") and the choice between CB-lead and pure-IB syndicates (under the heading "CB-Lead vs. Pure-IB") are estimated in a similar manner.

The set of variables used to study investment banks' role to alleviate the conflicts of interest of commercial banks include the issue purpose of refinancing bank debt and its interaction with interest expense, and its interaction with underwriter loans. The proxy for distribution ability is issue size. Firm size, prior securities issuance, prestigious bank loans, capital investment, new issue, and Tobin's q are proxies to test the certification enhancement role of commercial banks. Other firm characteristics, such as cash holdings, S&P stock rankings, credit ratings, profitability, and leverage are controlled for in the analysis.¹¹ By nature, hybrid syndicates (at least two underwriters in the syndicates) tend to be larger than the other two types of syndicates, which may have only one

¹⁰ The new issue variable means to capture a debt IPO. Because the data in SDC Platinum starts from 1970 and the sample in this paper starts from 1991, I use 20 years to determine if there is any other bond issuance prior to the current issue. Besides, using 10 years as the cutoff does not change the results. The correlation between these two variable specifications is 0.95.

¹¹ See Pinkowitz and Williamson (2001) for a study of bank power and cash holdings. For studies of underwriter reputation and firm characteristics, see Titman and Trueman (1986) and Chemmanur and Fulghieri (1994).

Table VI
Estimates of the Determinants of Syndicate Decisions

This table reports the pairwise probit estimates and the values of a z-test of syndicate decisions. The syndicate decision equations are presented in Section II. The column under the heading "Hybrid vs. Pure-IB" reports the syndication decision of investment banks. The dependent variable, hybrid, is 1 if an investment bank allows commercial banks to participate in the investment bank lead syndicate, and 0 if an investment bank excludes commercial banks in the syndicate. The subsample used for investment banks' syndication decision is bond issues underwritten by hybrid and by pure-IB syndicates. The column under the heading "Hybrid vs. CB-Lead" reports the syndication decision of commercial banks. The dependent variable, hybrid, is 1 if a commercial bank participates in an investment bank lead syndicate, and 0 if a commercial bank leads the syndicate. Therefore, I use the subsample of bond issues underwritten by hybrid and by CB-lead syndicates to estimate the commercial banks' syndication decision. The column under the heading "CB-Lead vs. Pure-IB" reports the selection of CB-lead (the value of dependent variable is 1) or pure-IB syndicates (that is 0). The subsample used is bond issues underwritten by CB-lead and by pure-IB syndicates. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks. CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. $\ln(1 + \text{total amount of prior bond issues})$ is the natural logarithm of one plus the total amount (\$MM) of bonds issued within the 3-year period prior to the current bond issuance. $\ln(1 + \text{frequency of prior equity issues})$ is the natural logarithm of one plus the number of equity issued within the 3-year period prior to the current bond issuance. Same underwriter in prior bond (equity) issuance equals 1 if a client used the current lead underwriter in prior bond (equity) issuance within the 3-year period, and is 0 otherwise. Total loans are existing loans borrowed from all banks. Prestigious bank loans are existing loans borrowed from banks with Section 20 subsidiaries. Underwriter loans are existing loans borrowed from the commercial banks that lead or participate as co-managers in the underwriting syndicates. Refinance bank debt (REFBD) equals 1 if the purpose of bond issuance is to refinance bank debt, and is 0 otherwise. Size of issue is the principal amount (\$MM) of bond issue. Syndicate size is the number of underwriters, including lead and co-managers, in a syndicate. NYSE equals 1 if the issuing firm's stock is listed on NYSE, and is 0 otherwise. Tobin's q is the book value of debt plus market value of equity divided by total assets. New issue (a debt IPO) equals 1 if there is no bond issuance within 20 years prior to the current bond issuance, and is 0 otherwise. S&P stock rankings: 16–18 equals 1 if S&P stock ranking is between 16 and 18, and is 0 otherwise. Other stock ranking dummies are defined similarly. Credit ratings: Aa equals 1 if the Moody's credit rating is Aa, and is 0 otherwise. Other credit ratings dummies are defined similarly. Noninvestment grade equals 1 if the Moody's credit rating is Ba or lower or nonrated, and is 0 otherwise. The estimates for the time period dummies and constant terms are not reported though they are included.

Dependent Variable Independent Variables	Hybrid vs. Pure-IB (Hybrid = 1)		Hybrid vs. CB-Lead (Hybrid = 1)		CB-Lead vs. Pure-IB (CB-Lead = 1)	
	Estimate	z-stat	Estimate	z-stat	Estimate	z-stat
	Prior 3-year Securities Issuance					
$\ln(1 + \text{total amount of prior bond issues})$	-0.10	-4.26***	-0.11	-3.14***	-0.01	-0.55
Same underwriter in prior bond issuance	0.25	2.45***	0.65	4.13***	-0.38	-4.14***
$\ln(1 + \text{frequency of prior equity issues})$	-0.18	-1.27	-0.65	-3.23***	0.41	3.23***
Same underwriter in prior equity issuance	0.35	2.39**	1.47	5.40***	-1.13	-4.90***

	Bank relationships				Firm and Issue Characteristics			
Ln(1 + total loans)	0.06	3.25***	0.03	0.87	0.01	0.50		
Prestigious bank loans/total loans*100	-0.002	-0.91	-0.001	-0.26	0.001	0.49		
Refinance bank debt (indicator variable)	0.12	1.25	0.67	2.60***	-0.20	-1.48		
Ln(1 + underwriter loans)	-	-	0.08	2.18**	-	-		
REFBD*Ln(1 + underwriter loans)	-	-	-0.14	-2.63***	-	-		
Firm and Issue Characteristics								
Ln(1 + size of issue)	0.08	1.59	0.35	4.87***	-0.34	-8.41***		
Ln(1 + market value of equity)	-0.18	-4.40***	0.17	2.52***	-0.19	-4.63***		
Capital expenditure/total assets*100	-0.02	-2.80***	0.003	0.29	-0.03	-4.11***		
Interest expense/operating income*100	-0.003	-1.40	-0.004	-0.75	-0.005	-1.74*		
REFBD*interest expense	-0.001	-0.43	-0.001	-0.18	0.003	0.94		
Syndicate size	0.61	17.73***	0.54	9.00***	0.19	4.87***		
NYSE (indicator variable)	0.25	1.80*	-0.20	-0.87	0.002	0.01		
Tobin's <i>q</i>	-0.002	-0.04	-0.45	-3.18***	0.06	1.51		
New issue (indicator variable)	-0.12	-0.84	0.13	0.64	-0.30	-1.91*		
Cash/total assets*100	-0.002	-0.25	0.03	2.25**	-0.02	-1.99**		
Operating income/total assets*100	0.005	0.65	0.04	2.59***	0.004	0.50		
Total debt/total assets*100	-0.001	-0.37	0.002	0.41	-0.01	-1.78*		
S&P stock rankings: 16-18	0.30	2.94***	0.51	2.97***	0.22	2.16**		
S&P stock rankings: 21-22	-0.17	-0.67	0.21	0.54	0.33	1.25		
S&P stock rankings: nonrated	-0.07	-0.54	0.40	1.93**	-0.06	-0.49		
Credit ratings: Aa	0.23	0.98	-0.04	-0.08	0.02	0.07		
Credit ratings: A	0.03	0.15	-0.50	-1.04	0.003	0.01		
Credit ratings: Baa	0.05	0.22	-0.68	-1.35	-0.07	-0.26		
Noninvestment grade	0.18	0.67	-0.32	-0.59	0.04	0.15		
Pseudo- <i>R</i> ²	0.36	-	0.45	-	0.21	-		
No. of observations	2,035	-	848	-	1,807	-		

*, **, and *** indicate significance at the 10, 5, and 1% levels, respectively, for a two-tailed test.

underwriter in the syndicate. One should control for the syndicate size to make the comparison meaningful. Exchange listing is also included for a similar reason. The yearly dummies are included but the results are not reported.

Compared to pure-IB syndicates, hybrid syndicates underwrite for firms that are smaller, raise smaller amounts of debt prior to the current bond issuance, use more bank debt, have lower common stock rankings, and invest less capital but issue larger sizes (marginally significant at 11%). Since the syndicate size and exchange listing are held constant in the analysis, the findings imply that hybrid syndicates possess better certification ability than pure investment banks. As discussed in Section III, hybrid clients seem to have more information problems because they are smaller and have lower common stock rankings or no stock ranking. Therefore, it is better for lead investment banks to enhance certification function by inviting banks' participation.

In addition, the less prior public debt access of hybrid clients in comparison to the larger issue size of current bond issuance is also consistent with the underwriting service-enhancing role of commercial banks. Despite the better underwriting services, lead investment banks choose to cooperate with commercial banks selectively. They tend to cooperate if their clients reuse these lead banks' underwriting services. Hybrid underwriting bonds resemble pure-IB underwriting bonds along the dimensions of credit ratings, interest expense, proportions of loans from prestigious banks, Tobin's q , new issue, cash holdings, profitability, leverage, and issuing bonds to repay bank debt.

Both hybrid and CB-lead syndicates are associated with firms investing less capital, which could result in a higher potential for borrower moral hazard. However, the reputation of lead investment banks enlarges the distance between lending and underwriting, which mitigates the moral hazard problem of borrowers more effectively than commercial banks and obtains more capital for these clients with a low level of investment prior to bond issuance.

Despite the finding that hybrid clients borrow more from the commercial bank underwriters in the syndicates, hybrid syndicates underwrite significantly more firms with lower stock rankings or no stock ranking, and issues with the purpose of refinancing bank debt than CB-lead syndicates do. The findings are consistent with the claim that hybrid syndicates could alleviate the conflicts of interest of commercial banks.

The results for firm characteristic control variables in Table VI also show that hybrid syndicates pick firms that are larger, richer in cash, and more profitable, since they are more dominant underwriters compared to CB-lead syndicates. However, CB-lead syndicates are associated with firms with higher Tobin's q , a proxy for information asymmetry and growth opportunity, which indicates that commercial banks have better information advantage or better financing flexibility than hybrid syndicates. The results of prior underwriter usage of CB-lead syndicates versus others are driven by regulation constraint.

Compared to pure-IB clients, CB-lead clients tend to have lower interest expense, middle stock rankings, and smaller issue size, consistent with the conflicts of interest and the distribution disadvantage of banks. The fact that CB-lead syndicates underwrite for smaller firms with higher Tobin's q that

invest less capital reinforces the findings regarding banks' certification ability. CB-lead clients also have less cash and lower leverage than pure-IB clients.

The distinct clientele of hybrid syndicates sheds some light on the possible economic rationale for cooperation between commercial banks and investment banks, and yields an understanding of the role of commercial banks as co-managers in the security underwriting business. These results are in line with the service enhancement hypothesis.

B. The Comparison of Underwriting Technologies

Table VII reports net yield regressions to contrast different underwriting technologies for different syndicates. Since I use net yields as the dependent variable in the regressions, the larger the beta coefficients, the lower the bond prices the syndicates can obtain for their clients when the measures of firm or issue characteristics increase.

The results in Table VII show that prior underwriter relationships enhance services. All the estimates on reusing prior underwriter services as lead underwriters are negative. However, only the estimates on reusing prior equity underwriters as current lead underwriters for hybrid and pure-IB syndicates are significant.¹² The insignificant results of CB-lead can be driven by the regulation constraint that there were very few equity underwriting activities by commercial banks prior to the current bond issuance.

Compared to pure-IB syndicates, both hybrid and CB-lead syndicates are worse for distributing issues, because the estimates on issue size are significantly positive both for hybrid and CB-lead syndicates. However, hybrid syndicates tend to underwrite for smaller firms with larger issue sizes that invest less capital and have less prior access to public capital markets. Both pure-IB and hybrid syndicates are led by investment banks. They could have similar distribution channels. Thus, the positive estimate on issue size in the hybrid net yield regression indicates that the issues underwritten by the hybrid syndicates are more difficult to float.

The estimates on interest expense relative to operating income and its interaction with the issue purpose of refinancing bank debt support the argument that hybrid syndicates mitigate commercial banks' conflicts of interest. The estimates on interest expense, its interaction with the refinance of bank debt, and the interaction between the refinance of bank debt and underwriter loans (marginally significant at 16%) are all positive in the CB-lead net yield regression, but insignificant or negative in the hybrid net yield regression. In addition, for pure-IB clients, net yields of their bonds increase with total bank loans but decrease with the proportion of loans borrowed from prestigious banks with

¹² Table VII reports two net yields regressions for hybrid syndicates because the estimates on endogenous selection terms are insignificant. Without the control of endogenous selection terms, the estimate on the same underwriters in prior equity issuance is significant in model (2) of Table VII. However, that for CB-lead syndicates remains insignificant without controlling for endogenous selections, and thus the results are not reported.

Table VII
Estimates of Bond Pricing Equations by Syndicate Type

This table reports the net yield regressions of syndicates. The dependent variable, basis point spread (BPS), is the premium of the ex ante yield spread of a bond over the ex ante yield of a U.S. Treasury security of similar maturity. Hybrid represents a syndicate in which an investment bank is the lead underwriter with one or more commercial banks as co-managers. Pure-IB syndicates contain only investment banks. CB-lead represents a syndicate in which a commercial bank is the lead underwriter, with or without other commercial banks or investment banks as co-managers. Ln(1 + total amount of prior bond issues) is the natural logarithm of one plus total amount (\$MM) of bonds issued within the 3-year period prior to the current bond issuance. Ln(1 + frequency of prior equity issues) is the natural logarithm of one plus the number of equity issued within the 3-year period prior to the current bond issuance. Same underwriter in prior bond (equity) issuance equals 1 if a client used the current lead underwriter in prior bond (equity) issuance within the 3-year period, and is 0 otherwise. Size of issue is the principal amount (\$MM) of bond issue. Total loans are existing loans borrowed from all banks. Prestigious bank loans are existing loans borrowed from banks with Section 20 subsidiaries. Underwriter loans are existing loans borrowed from the commercial banks that lead or participate as co-managers in the underwriting syndicates. Refinance bank debt (REFBD) equals 1 if the purpose of bond issuance is to refinance bank debt, and is 0 otherwise. New issue (a debt IPO) equals 1 if there is no bond issuance within 20 years prior to the current bond issuance, and is 0 otherwise. Endogenous selection terms used to control for endogenous selection biases arising from the syndicate decisions are defined in Section II and estimated from the first-stage probit estimation in Table VI. Endogenous selection (1) is $\frac{\phi(Z_{AVA})}{1-\phi(Z_{AVA})}$, (2) is $\frac{\phi(Z_{BIB})}{1-\phi(Z_{BIB})}$, (3) is $\frac{\phi(Z_{AVA})}{1-\phi(Z_{AVA})}$, (4) is $\frac{\phi(Z_{AVA})}{\phi(Z_{AVA})}$, (5) is $\frac{\phi(Z_{BIB})}{\phi(Z_{BIB})}$, and (6) is $\frac{\phi(Z_{BIB})}{1-\phi(Z_{BIB})}$. The corresponding coefficients are the estimates of σ_{A1} , σ_{B1} , σ_{A2} , σ_{C2} , σ_{B3} , and σ_{C3} , respectively. Tobin's q is the book value of debt plus market value of equity divided by total assets. The estimates for the S&P stock rankings, credit ratings dummies, time period dummies, and constant terms are not reported though they are included. Stock rankings dummies include the middle rankings (16–18), low rankings (21–22), and no ranking. Credit ratings dummies include Moody's Aa, A, Baa, Ba, B, C, and nonrated.

Independent Variables	Hybrid (1)		Hybrid (2)		Pure-IB		CB-Lead	
	Estimate	t-statistics	Estimate	t-statistics	Estimate	t-statistics	Estimate	t-statistics
Ln(1 + total amount of prior bond issues)	0.49	0.33	1.09	0.75	2.12	2.08**	1.13	0.58
Same underwriter in prior bond issuance	-6.56	-0.83	-7.73	-1.09	-4.64	-0.99	-4.29	-0.51
Ln(1 + frequency of prior equity issues)	0.56	0.06	2.92	0.33	1.37	0.21	-7.80	-0.74
Same underwriter in prior equity issuance	-10.23	-0.89	-16.18	-1.78*	-22.26	-2.64***	-30.41	-1.10
Size of issue/total assets*100	0.45	2.53***	0.42	2.34**	0.03	0.78	0.38	3.15***
Refinance bank debt (indicator variable)	10.12	0.92	10.60	1.05	-6.23	-1.48	-24.36	-1.52
Ln(1 + underwriter loans)	0.31	0.20	-0.39	-0.28	-	-	-4.41	-2.06**
REFBD*Ln(1 + underwriter loans)	-2.42	-1.13	-2.54	-1.31	-	-	4.64	1.41
Ln(1 + total loans)	-1.91	-1.34	-2.15	-1.52	2.17	2.74***	0.67	0.35
Prestigious bank loans/total loans*100	0.24	1.98**	0.27	2.23**	-0.19	-2.52***	0.36	2.31**

Interest expense/operating income*100	0.22	0.97	0.26	1.14	0.20	3.60***	0.56	2.18**
REFFBD* interest expense	0.06	0.26	0.02	0.08	-0.02	-0.39	0.37	1.34
Ln(1 + market value of equity)	-2.21	-0.59	-3.19	-1.11	-16.77	-8.04***	-9.14	-2.15**
New issue (indicator variable)	-11.69	-1.41	-11.66	-1.42	20.23	2.95***	24.26	1.83*
Endogenous selection (1): IB inviting CB	11.74	0.98	-	-	-	-	-	-
Endogenous selection (2): CB joining IB	9.87	0.48	-	-	-	-	-	-
Endogenous selection (3): IB excluding CB	-	-	-	-	-8.30	-1.66*	-	-
Endogenous selection (4): choosing IB over CB	-	-	-	-	38.23	2.68***	-	-
Endogenous selection (5): CB leading	-	-	-	-	-	-	-3.07	-0.47
Endogenous selection (6): choosing CB over IB	-	-	-	-	-	-	4.74	0.35
Tobin's q	-12.03	-1.71*	-9.19	-1.48	1.11	0.37	-6.58	-0.85
Cash/total assets*100	1.94	3.62***	1.76	3.65***	0.51	1.51	0.98	0.99
Capital expenditure/total assets*100	1.05	2.60***	1.08	2.76***	0.58	1.98**	1.15	1.60
Operating income/total assets*100	-0.81	-1.43	-0.85	-1.58	-0.93	-2.67***	-0.49	-0.48
Total debt/total assets*100	-0.23	-1.12	-0.27	-1.39	0.03	0.25	-0.68	-2.51***
Adjusted R^2	0.85	-	0.84	-	0.82	-	0.88	-
No. of observations	516	-	516	-	1,195	-	246	-

*, **, and *** indicate significance at the 10, 5, and 1% levels, respectively, for a two-tailed test

underwriting capacity. However, the other two types of clients pay higher net yields when the proportion of loans borrowed from prestigious banks increases. The findings indicate that investors believe that pure-IB syndicates have the least potential for conflicts of interest arising from lending relationships.

The estimates on exogenous information proxies, such as new issue and Tobin's q , indicate better certification capacity of hybrid syndicates because both estimates are marginally significantly negative in Table VII. However, those for pure-IB or CB-lead syndicates are either insignificantly different from zero or significantly positive.

The estimate on the endogenous selection term (1), IB inviting CB, is insignificant for hybrid clients. That on the endogenous selection term (3), IB excluding CB, is significantly negative for pure-IB clients, which implies that $E(y_{2i} | A_i = 0, C_i = 0) > E(y_{2i} | C_i = 0)$. In other words, the pure-IB clients—that is, lead investment banks excluding banks' participation—pay higher net yields (8 basis points) than the mean net yields of all bond issues lead-underwritten by investment banks (unconditional on the syndication decision). As one could recall, investment banks tend to permit banks' involvement and enhance clients' underwriting services if the clients reuse their services as lead banks. These results are consistent with the explanation that lead investment banks are concerned with commercial banks and can build relationships with clients through syndicate participation.

Regarding the commercial banks' syndication decision, there is no evidence of endogenous selectivity. The estimates on the endogenous selection terms (2) and (5) in Table VII are insignificant. One possible explanation is that commercial banks might not be in the position to decide whether or not to co-manage an issue endogenously. Given the larger market shares of investment banks during 1991 to 1996, it makes sense that they are the major decision makers in hybrid syndicate formation. In the econometric sense, the syndication decision of commercial banks is redundant. There is no need to control for such a decision in the net yield regressions since the observations are not censored by the banks' choices.

Another significant estimate is that on the endogenous selection term (4), choosing IB over CB. The positive estimate of σ_{C2} (38.23) indicates that pure-IB underwriting bonds have significantly lower net yields conditional on the choice between a commercial bank and an investment bank lead syndicate.¹³ Therefore, in comparison to CB-lead syndicates, pure-IB syndicates retain higher (endogenous) quality clients who are paying lower net yields than the mean net yields of bonds issued by pooling pure-IB and CB-lead clients together.

In summary, this study shows that the underwriting technology of hybrid syndicates is different from those of CB-lead and pure-IB syndicates. The hybrid structure creates synergies beyond the simple average of the other two organizational forms, which should be beneficial to many issuing firms in the economy. Consistent with the service enhancement hypothesis, hybrid syndicate

¹³ The endogenous selection term (4), $\frac{-\phi(Z_{CYC})}{\Phi(Z_{CYC})}$, is always negative, so the positive estimate of σ_{C2} indicates lower net yields.

formation is a conscious decision motivated by mutual benefits to both underwriters.

V. Conclusions

This study examines the economic rationales of syndication between two types of bond underwriters—the entrant commercial banks and the incumbent investment banks. The evidence strongly supports the proposition that the coalitions between rival underwriters with complementary abilities provide mutual benefits to the counter party. It also enhances the underwriting services for the clients.

Specifically, the combined lending and underwriting capacity of commercial banks enhances the certification function of hybrid syndicates, which in turn permits hybrid syndicates to serve the market segments that are more of a challenge to underwrite. Despite the enhanced services resulting from inviting commercial banks' participation, investment banks tend to exclude banks' participation when the clients exhibit less loyalty in reusing them as lead investment banks.

The reputation of a lead investment bank as an independent third party permits more hybrid clients to issue bonds with the purpose of repaying bank debt without price discounts, even if those clients also borrow from commercial bank co-managers in the syndicates. These results highlight the need for the existence of an independent investment bank that is free of the moral hazard and adverse selection problems that plague commercial banks, particularly where the underwriting and lending activities are closely combined.

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