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Syndicate*

by
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Competition and Coalition Among Underwriters: The Decision to Join a Syndicate

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Abstract

This paper tests a strategic syndication hypothesis that bond underwriters with different comparative advantages cooperate strategically to meet certain clients' demands by organizing hybrid syndicates (commercial banks participate as co-managers in investment bank lead 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 ranking and less prior access to the capital markets, rely more on bank loans, invest less capital, but issue larger amounts, which indicates 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 examine empirically the economics of syndicate formation. In 1989, the Board granted five commercial banks the permission to underwrite corporate bonds through the so-called “Section 20 Subsidiaries.”¹ During the process of repealing the Glass-Steagall Act, which separated commercial banking and investment banking in the U.S., incumbent investment banks have been the major opponents of the repeal. Although investment banks have competed fiercely with entrant commercial banks in the legislative arena, commercial bank 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, at the early bank entry stage, why didn't investment banks compete more aggressively by excluding commercial banks in the syndicates? If commercial banks do not provide additional functions compared to other investment banks in enhancing underwriting services, wouldn't it be more rational for lead investment banks to cooperate with other investment bank "friends" and leave commercial bank "rivals" out of the circle? Although coalition among underwriters is a common practice, Hansen and Khanna (1994) review various studies in investment banking and find that syndicate formation and competition remain relatively unexplored. Such an observation is still valid even today, which makes this paper rather unique among the empirical security underwriting literature.

Two theoretical studies provide economic rationales for coalitions between underwriters. Anand and Galetovic (2000) argue that when information produced by investment banks is nonexcludable (the action to underwrite for a firm provides information that can not be excluded from other underwriters), cooperation between firms may be necessary for the market to exist.

Pichler and Wilhelm (2001) construct a model that suggests 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. These papers suggest that the decision to form syndicates is beyond the obvious risk sharing consideration and are driven by the motivations to minimize information free riding problem and to enhance information production and underwriting services.

The main objective of this paper is to investigate the decisions of syndicate formation and the impact of such decisions on underwriting services. Specifically, this study tests a strategic syndication hypothesis that service enhancing motivates the coalitions between rival underwriters. In other words, syndicate formation is not a random occurrence. It is a conscious strategic decision. Moreover, 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.²

Song (2002) shows that commercial banks and investment banks possess different comparative advantages at the lead underwriter level. The unique underwriting technologies are each valued by different clienteles. Commercial banks' dual roles as lenders and underwriters enhance information efficiency or financing flexibility, which permits banks to better serve the clients with higher demand for certification, such as smaller firms. However, the better certification ability is offset by the potential for conflicts of interest that banks could underwrite for poor firms and try to use the proceeds to repay bank debt. Commercial bank clients with low coverage ratios that issue bonds to repay bank debt suffer from more severe price discounts. Such clients have a greater need for independent investment banks' certification. Furthermore, investment banks possess better distribution ability. The pros and cons of bank underwriting

demonstrated in Song (2002) indicate that there is no complete dominance by either of these two types of underwriters. Lead commercial banks serve certain clients better than lead investment banks, and vice versa.

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. This cooperative arrangement 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, could the coalitions between different underwriters with complementary abilities create synergies and provide better services for clients with special needs? This study also addresses the question of whether the reputation and the distribution network of lead investment banks could mitigate the conflicts of interest and the distribution disadvantage of commercial banks and yield higher bond prices for Hybrid clients than commercial bank lead (CB-Lead) syndicates.

To test the strategic syndication hypothesis, I use a switching simultaneous-equations model described in Maddala (1983).³ 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 selection or switching problem. If the underlying endogenous switching is consistent with enhancing underwriting service, we should observe that the bond prices are higher conditional on underwriters' syndicate choices. In other words, for a particular client, if the client's bond price could be higher by inviting

commercial banks to join the syndicate, a rational lead investment bank should do so. Because higher bond price means more proceeds for its client, this may help to retain the client and to attract more business in the future.

Using a sample of 2345 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.⁴ 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 percent at the end of 1996, there are many high profile mergers between lead underwriters of different types. Song and Goldberg (2002) study these mergers and the bond underwriting market and find that the market moves towards an equilibrium state over time where the underwriting performance of different entities is less distinct. Therefore, the period from 1991 to 1996 provides a precious sample that makes the test of strategic syndication hypothesis possible.

The findings of this paper 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 ranking and less prior access to the capital markets, rely more on bank loans, invest less capital, but issue larger amounts. Such issues appear to be more difficult to underwrite due to a greater information problem since they are comprised of smaller firms with lower stock ranking and less prior access to the capital markets. This argument is further supported by the higher net yields paid by Hybrid clients than by Pure-IB clients as issue amounts increase. Because Hybrid and Pure-IB syndicates are both led by investment banks, they should be able to organize similar distribution channels. These results suggest that Hybrid clients are special and lead investment banks could enhance underwriting services by inviting commercial banks to join the syndicates, which in turn, permit Hybrid syndicates to engage in the more

challenging market segments and enhance hybrid clients' access to the public debt market.

Hybrid clients also have lower stock ranking and less prior access to the capital market but issue larger amounts than CB-Lead clients. Besides, in contrast to CB-Lead syndicates, Hybrid syndicates underwrite more issues with the purpose of repaying bank debt and without common stock ranking. 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 investment banks could alleviate the bank co-managers' conflicts of interest in the Hybrid syndicates.

Moreover, lead investment banks choose to invite banks' participation when the clients exhibit higher loyalty in reusing their underwriting services. Reusing lead underwriters' services also reduces the net yields paid by clients, in particular, if investment banks were the lead underwriters in the prior equity issuance. In addition, there is no evidence of endogenous selections for both hybrid and CB-Lead clients. However, there are significant endogenous selections for Pure-IB clients, which indicates that lead investment banks' syndication decisions causes sorting (endogenous switching) among their clients. The insignificant results for commercial banks' syndication decisions indicate that the control of such endogenous selection is redundant in the net yield regression analysis. The finding implies that investment banks are the dominant players to determine syndicate formation.

In summary, 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 particular bond issuance. Syndicate formation is the result of conscious strategic considerations.

However, it is the 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

Given that commercial banks have entered the security underwriting business, they face two choices - competing or cooperating with investment banks. Since a lead manager may grab a large share of the underwriting compensation and build reputation for future underwriting business, it seems reasonable to assume that a commercial bank would compete more aggressively in acquiring the lead-underwriter role when it possesses stronger market power. Conversely, when it is a smaller player in a given market, it seems rational for a commercial bank to cooperate with others who may complement its weakness.

While the reasons for commercial banks to cooperate with investment banks are apparent, the reverse may not be so obvious. In the following subsection, I review the literature regarding the economic functions of syndicates and the possible reasons for coalitions among underwriters in general in the security underwriting business in addition to the obvious risk-sharing argument.⁵ In subsection B, I explore possible circumstances under which commercial banks may need to cooperate rather than to compete.

A. The Syndication Decision of Investment Banks

Anand and Galetovic (2000) provide an explanation for oligopolistic behavior in the investment banking industry when property rights over information are weak. When inputs are nonexcludable, cooperation between firms may be necessary for the market to exist.

Bhattacharyya and Nanda (2000) discuss similar issues regarding cooperative arrangements among investment banks in the context of introducing innovative financial products. In their study, they show that an asymmetric distribution of market shares will tend to enhance innovation activity not only because the large bank has greater incentives to innovate but also because it is the natural partner for smaller banks in cooperative arrangements. As White (1996) argues, innovations can be organizational, involving new ways of doing things.

Because of the combined lending and underwriting, commercial banks provide better certification function than investment banks.⁶ However, they are much smaller than investment banks in terms of market share, which indicates that commercial banks could not handle large issues effectively. Therefore, 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.

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, and firms that have less access to the capital markets prior to the usage of hybrid syndicates. Compared to Pure-IB syndicates, the price discounts for these firms should be less severe and the cost of information production should be lower when Hybrid syndicates underwrite for them. The definition of each certification proxy variable is listed in Table I.

[Table I about here]

On the other hand, if a pure investment bank arrangement could do better than forming a coalition with commercial banks, lead investment banks should exclude banks' participation. I test this conscious decision as a strategic syndication hypothesis. This new way of underwriting would have never been available without the entry of commercial banks and the accommodation of investment banks.

B The Syndication Decision of Commercial Banks

Pichler and Wilhelm (2001) construct a model and suggest that the economic function of the syndicate formation is to provide a monitoring role for the lead underwriter and to mitigate the moral hazard problem of information production. Nanda and Yun (1997) find that lead managers share a larger proportion of the damage to reputation arising from an unsuccessful offering. Jain and Kini (1999) find evidence consistent with the demand for lead underwriter monitoring in initial public offerings (IPOs). The post-issue performance of IPO firms is positively associated with the reputation of the lead bank.

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. For a commercial bank with a lending relationship with the issuer, however, it may pay to participate in a syndicate as a co-manager and capitalize on a reputable investment bank's certification strength, rather than to fight for the lead manager role.

Kanatas and Qi (1998a) compare the level of information production in specialized versus integrated (combined lending and underwriting) institutions. They find that universal banks have less incentive to provide the costly efforts that will aid the successful marketing of their client's

securities. In related work, Kanatas and Qi (1998b) demonstrate that the incentive conflict of integrated intermediaries may impose a cost on their customers seeking to raise capital and that the regulatory separation of lending and underwriting may be optimal. 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), Gompers and Lerner (1999), and Cummins, Weiss, and Zi (1997), provide evidence of an endogenously derived intermediary structure to reduce the conflicts of interest or the cost of production.

Therefore, commercial banks could enter the security underwriting business by cooperating with a reputable investment bank to enlarge the distance between underwriting and lending when concern for conflicts of interest perceived by the market is serious. Besides, commercial banks could utilize the distribution network investment banks possess to underwrite for larger issues. I test if lead investment banks in Hybrid syndicates could mitigate the conflicts of interest and the distribution disadvantage of commercial banks. The proxies for conflicts of interest are the issue purpose of repaying bank debt, its interaction with interest expense and with underwriter lending relationship (underwriter loans). The proxy for distribution ability is issue size.

C. Clients' Prior Securities Issuance 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 on-going relationships have profound effects on the behavior of intermediaries and the consequence of intermediary services.⁷ For example, Krigman, Shaw, and Womack (2001)

study the usage of underwriter services in initial public offerings (IPOs) and in subsequent seasoned equity offerings (SEOs). They find that clients that switch to different underwriters for subsequent SEOs raise fewer proceeds than expected, while non-switchers raise significantly larger amounts.⁸ Furthermore, Nanda and Warther (1998) find that firms that are more loyal to their primary investment banks tend to pay higher fees. They conclude that the higher compensation may partially reflect the higher level of underwriting advice and services regularly sought by the less experienced and unsophisticated issuers.

If Hybrid clients are those requiring higher level of services, such as increased access to capital markets, then both the loyalty notion suggested by Nanda and Warther (1998) and the higher proceeds of non-switchers found by Krigman, Shaw, and Womack (2001) suggest that 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 more loyal clients. All 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 issuance and the number of equity issuance 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 issuance are also included. Due to regulatory restriction (banks could not underwrite corporate bonds until 1989 and equity until 1990), CB-Lead clients tend to use the same lead underwriters less frequently than the clients of the other two syndicates.

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 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 could be censored by those decisions.⁹ 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.¹⁰ Formally, the empirical model is as follows:

$$y_{1i} = X_i \beta_1 + u_{1i} \quad (1) \text{ (underwriting technology for Hybrid syndicate)}$$

$$y_{2i} = X_i \beta_2 + u_{2i} \quad (2) \text{ (underwriting technology for Pure-IB syndicate)}$$

$$y_{3i} = X_i \beta_3 + u_{3i} \quad (3) \text{ (underwriting technology for CB-Lead syndicate)}$$

$$A_i^* = -(Z_{Ai} \gamma_A - \varepsilon_{Ai}) \quad (4) \text{ (investment bank's syndication decision equation)}$$

$$B_i^* = -(Z_{Bi} \gamma_B - \varepsilon_{Bi}) \quad (5) \text{ (commercial bank's syndication decision equation)}$$

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, subscript 2 refers to that by a Pure-IB syndicate, subscript 3 refers to that by a CB-Lead syndicate. If these three syndicates have different underwriting abilities, there should be three different net yield (bond-pricing) equations to describe these distinct underwriting technologies. A_i^* and B_i^* are the underlying syndication values for investment banks and commercial banks, respectively. 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.¹¹ 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 syndicate. The net yields of firm i using the other two unselected syndicates would not be observed. Therefore,

$$A_i = 1 \text{ iff } A_i^* > 0 \quad (6) (y_{1i} < y_{2i})$$

$$A_i = 0 \text{ iff } A_i^* \leq 0 \quad (7) (y_{1i} \geq y_{2i})$$

$$B_i = 1 \text{ iff } B_i^* > 0 \quad (8) (y_{1i} < y_{3i})$$

$$B_i = 0 \text{ iff } B_i^* \leq 0 \quad (9) (y_{1i} \geq y_{3i})$$

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 0 otherwise. B_i is a dummy variable taking the value 1 if a commercial bank joins the Hybrid syndicate that underwrites for firm i, and 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 all the error terms with mean zero and the correlations between errors are normally distributed and $\text{Cov}(\varepsilon_A, \varepsilon_B) = 0$, the

conditional mean net yield of a bond underwritten by a Hybrid syndicate is given by the following:¹²

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

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 σ_{A1} (σ_{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 that Hybrid clients are those that lead investment banks have served better by inviting banks' participation in obtaining lower net yields. Moreover, the "better" endogenous syndicate choice implied by 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.¹³

Likewise, if a lead investment bank decides to exclude commercial banks and firm i also 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 net yield 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, i.e., 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 2345 public bond offerings between January 1, 1991 and December 31, 1996.¹⁴ 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 and firm characteristics measured at the end of the year prior to bond issuance from COMPUSTAT and CRSP. In order to be included in the analysis, an issuing firm must have data available on SDC, 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.¹⁵

[Table II about here]

The frequency and percentage of bond issues by year and by syndicate type during the period 1991 to 1996 are reported in Panels A and B, Table II, respectively. Over the six-year period, CB-Lead syndicates managed 310 bond issues. There are 538 issues underwritten by the Hybrid syndicates. Pure-IB syndicates underwrite 1497 issues. The underwriting of Hybrid syndicates has increased dramatically from 7.4 percent of total bond issues in 1991 to 31.4 percent in 1996. This increase is at the expense of Pure-IB syndicates, which underwrite 85.5 percent of bond issues in 1991, but only 50.3 percent in 1996. CB-Lead syndicates underwrite 7.1 percent of bond issues in 1991 and 18.3 percent in 1996.

[Table III about here]

Table III reports the percentages of bonds underwritten by different types of syndicates in small and large issue markets segmented by median issue size (\$150 million). In the small issue

market, the percentage of CB-Lead managed bond issues is 18.7, 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 III, 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.¹⁶ Issues managed by CB-Lead and 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 (2002) 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 could have a better distribution network and that is not restricted by the 10 percent 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 IV about here]

Table IV documents the paired comparisons in issue characteristics and clients' prior securities issuance between Hybrid and CB-Lead syndicates, as well as 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 from investment banks do, which causes Hybrid syndicates to be so distinct in

clientele.

Table IV also shows that, conditional on clients having issued securities within the 3-year period prior to 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 one 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 issuance 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 Hybrid syndicate. However, the use of Hybrid syndicates for current bond issuance permits them to increase the issue size.

[Table V about here]

Table V 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 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 in 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 holding.

[Table VI about here]

Table VI reports the frequency of selective issue characteristics. It shows that only 1.9 percent of CB-lead clients use the same lead underwriters in the prior equity issuance within 3 years. That of Hybrid clients is 16.9 percent, which is significantly larger than the 8 percent 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 percent of Hybrid and Pure-IB clients are found to use the same IPO underwriters.

Table VI also shows that Hybrid syndicates underwrite the highest percentage of new issues, issues for the purpose of refinancing bank debt, and non-investment grade bonds.¹⁷ Pure-IB syndicates serve the highest percentage (39.4) of clients with high S&P stock ranking (7-9), but the

lowest percentage (33.5) of clients with middle stock ranking (16-18). Among the CB-Lead clients, 48.1% of them have middle stock ranking, which is the highest among different syndicates. Hybrid syndicates have the highest percentage (32.3) of clients without common stock ranking, which is consistent with the notion that Hybrid clients have 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 VII about here]

Table VII presents the probit analyses of the underwriters' syndication decisions. The results reported under the heading of "Hybrid vs. Pure-IB" represent the syndication decision of investment banks. The dependent variable, Hybrid, is 1 if an investment bank invites commercial banks to participate in the syndicate, 0 if it excludes commercial banks from the syndicate. 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 of "Hybrid vs. CB-Lead") and the choice between CB-Lead and Pure-IB syndicates (under the heading of "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 holding, S&P stock ranking, credit ratings, profitability,

and leverage are controlled for in the analysis.¹⁸ 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 underwriter in the syndicate. One should control the syndicate size to make the comparison meaningful. Exchange listing is also included for a similar reason. The year dummies are also 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 ranking, 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 with 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, proportion of loans from prestigious banks, Tobin's q, new issue, cash holding, 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. The fact that Hybrid syndicates

engaged in much larger issue sizes than CB-Lead syndicates is consistent with Kanatas and Qi (1998a). The reputation of lead investment banks enlarges the distance between lending and underwriting, which mitigate the moral hazard problem of borrowers more effectively than commercial banks and obtain more capital for these clients with a low level of investment prior to bond issuance.

Despite the fact 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 underwrite. 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 VII also show that Hybrid syndicates pick firms that are larger, cash richer, and more profitable since they are more dominant underwriters compared with 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 higher interest expense, lower stock ranking, 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 reinforce the findings regarding the certification ability of commercial banks. CB-Lead clients also have less cash and lower leverage than Pure-IB syndicates.

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 strategic syndication hypothesis.

B. The Comparison of Underwriting Technologies

[Table VIII about here]

Table VIII 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 could obtain for their clients when the measures of firm or issue characteristics increase.

The results in Table VIII 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.¹⁹ 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 for both 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. It could have similar distribution channels. Therefore, it is more likely that 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 purpose of issue is to refinance bank debt support the argument that Hybrid syndicates mitigate commercial banks' conflicts of interest to some extent. 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 significantly positive in the CB-Lead net yield regression but insignificant 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 the prestigious banks that have security underwriting capacity. However, the other two types of clients pay higher net yields when the proportion of loans borrowed from the 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 VIII. 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 words, the Pure-IB clients, i.e., 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 that 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 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 VIII 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.²⁰ 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 strategic syndication hypothesis, Hybrid syndicate 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 from both endogenous and exogenous factors strongly supports the proposition that observed syndicate formation among underwriters is not a random occurrence. It is the result of deliberate strategic behavior. 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. In contrast to Pure-IB syndicates, Hybrid syndicates underwrite firms that are smaller, have lower common stock rankings and less prior access to the capital markets, rely more on bank loans, invest less capital, but issue larger amounts. The higher net yields on issue size also demonstrates that Hybrid syndicates are engaged in the market segments that are more challenging to underwrite because both Pure-IB and Hybrid syndicates are led by investment banks. They should be able to organize similar distribution channels.

The findings of endogenous selection imply that incumbent lead investment banks are the primary decision makers in organizing the syndicates. The insignificant result on endogenous selection for commercial banks indicates that the control of banks' syndication decisions is redundant in the net yield regression. 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. The findings support the proposition that lead investment banks could mitigate the conflicts of interest of commercial banks. In addition, by joining investment bank lead syndicates, commercial banks are able to participate in the large issue market, which would be more difficult for commercial banks to penetrate as lead underwriters at the early entry stage because of their distribution disadvantage.

The benefits of bank entry to issuing clients are by no means limited to the cases where commercial banks lead the syndicates. The creation of a Hybrid organizational form is impossible without the participation of commercial banks as co-managers. By considering only commercial bank lead syndicates, previous studies on the effects of commercial banks' increased underwriting activities provide an incomplete assessment of the economics of bank entry. This paper fills the above gap and provides another way to view the bank entry phenomenon. The results in this paper also 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.

Moreover, the evidence regarding the strategic behavior in syndicate formation has important implications for empirical research in this area. An empirical methodology assuming random occurrence of observed syndicate formation may provide misleading results. Furthermore, the structures of the financial intermediaries and markets are still evolving. It demands continuous research in this important industry.

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Table I
List of Variables

Variable Name	Variable Definition
<i>Syndicate type</i>	
Hybrid syndicate	The value is 1 if an investment bank leads the syndicate with one or more commercial banks as co-managers, 0 otherwise.
Pure-IB syndicate	The value is 1 if the syndicate only contains investment banks as lead and co-managers, 0 otherwise.
CB-Lead syndicate	The value is 1 if a commercial bank leads the syndicate with or without other commercial banks or investment banks as co-managers, 0 otherwise.
<i>Prior 3-year security issuance</i>	
Ln(total amount of prior bond issues)	Log of one plus total amount (\$MM) of bonds issued within 3 years prior to the current bond issuance
Ln(frequency of prior equity issues)	Log of one plus total number of equity issued within 3 years prior to the current bond issuance
Same underwriter in prior bond (equity) issuance	The value is 1 if a client used the current lead underwriter in prior bond (equity) issuance within 3 years, 0 otherwise.
<i>Bank relationships</i>	
Ln(total loans)	Log of one plus existing loans (\$MM) borrowed from all banks.
Ln(Prestigious bank loans)	Log of one plus existing loans (\$MM) borrowed from banks with Section 20 subsidiaries.
Ln(Underwriter loans)	Log of one plus existing loans (\$MM) borrowed from the commercial banks that lead or participate as co-managers in the underwriting syndicate.
Refinance bank debt (REFBD)	The value is 1 if the purpose of bond issuance is to refinance bank debt, 0 otherwise.
REFBD*Underwriter loans	The interaction between REFBD and Ln(Underwriter loans)
<i>Other Issue and Firm Characteristics</i>	
Net yields	The premium of the ex ante yield spread of a bond over the ex ante yield of U.S. Treasury security of similar maturity.
Underwriting fees	Dollars charged for each 1000 dollars of bond issue, including management fee, underwriting fee, and selling concession.
Syndicate size	The number of underwriters, including lead and co-managers, in a syndicate.
New issue (a debt IPO)	The value is 1 if there is no bond issuance within 20 years prior to the current bond issuance, 0 otherwise.
REFBD*interest expense	The interaction between REFBD and interest expense relative to operating income.
Ln(size of issue)	Log of one plus the principal amount of bond issue.
NYSE	The value is 1 if the issuing firm's stock is listed on NYSE, 0 otherwise.
Tobin's q	The book value of debt plus market value of equity divided by total assets.
S&P stock ranking: 16-18	The value is 1 if S&P stock ranking is in between 16 to 18, 0 otherwise. Other stock ranking dummies are defined similarly.
Credit rating: Aa	The value is 1 if the Moody's credit rating is Aa, 0 otherwise. Other credit rating dummies are defined similarly.
Non-investment grade	The value is 1 if the Moody's credit rating is Ba or lower or non-rated, 0 otherwise.
Age of firms	The number of years since the first date that the data are available from CRSP.
Endogenous selection variables (Inverse Mill's ratios)	(1) is $\frac{\phi(Z_A\gamma_A)}{1 - \Phi(Z_A\gamma_A)}$, (2) is $\frac{\phi(Z_B\gamma_B)}{1 - \Phi(Z_B\gamma_B)}$, (3) is $\frac{-\phi(Z_A\gamma_A)}{\Phi(Z_A\gamma_A)}$, (4) is $\frac{-\phi(Z_C\gamma_C)}{\Phi(Z_C\gamma_C)}$, (5) is $\frac{-\phi(Z_B\gamma_B)}{\Phi(Z_B\gamma_B)}$, and (6) is $\frac{\phi(Z_C\gamma_C)}{1 - \Phi(Z_C\gamma_C)}$.

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

This table presents total numbers and percentages of bond issues in Panel A and B, respectively. 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
Panel A. The Frequency of Bond Issues				
1991	26	27	312	365
1992	36	78	263	377
1993	43	106	300	449
1994	26	55	137	218
1995	83	107	221	411
1996	96	165	264	525
1991-1996	310	538	1497	2345
Panel B. The Percentage of Bond Issues				
1991	7.1	7.4	85.5	100
1992	9.6	20.7	69.8	100
1993	9.6	23.6	66.8	100
1994	11.9	25.2	62.8	100
1995	20.2	26.0	53.8	100
1996	18.3	31.4	50.3	100
1991-1996	13.2	22.9	63.8	100

Table III
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, i.e., 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	1246
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	1099

Table IV
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. When mean and median of a variable are reported, the difference between two types of underwriters in means is tested by *t*-test and the difference in medians by Wilcoxon rank-sum test. See Table I for the definition of each variable.

Variable	CB-Lead			Hybrid			Pure-IB		
	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median
Issue size (million dollars)	310	86.6 ^{***}	50.0 ^{***}	538	208.4	175.0	1497	149.8 ^{***}	100.0 ^{***}
Net yield (basis point spread)	246	117.7 ^{***}	71.5 ^{***}	516	144.9	90.0	1195	132.6 [*]	84.0 ^{***}
Underwriting fee (dollars spread/\$1000)	186	9.6	6.5 ^{***}	522	10.4	6.8	1170	9.4 ^{***}	6.5 ^{***}
Syndicate size (Number of Underwriters)	310	1.8 ^{***}	1.0 ^{***}	538	3.6	3.0	1497	2.0 ^{***}	2.0 ^{***}
Maturity of issue (years)	310	10.3 ^{***}	10.0 ^{***}	538	15.0	10.0	1497	13.3 ^{***}	10.0 ^{***}
Number of different lead underwriters used in prior 3-yr bond issuance	222	2.09	2	346	2.45	2	1199	2.85	2
Frequency of prior 3-yr bond issuance	222	4.94	3	346	6.20	4	1199	7.50	5
Total amount of prior 3-yr bond issuance	222	563.9 ^{***}	250 ^{***}	346	1013.0	550	1199	1211.5 ^{***}	660 ^{**}
LN(Frequency of prior bond issuance)	310	1.09	1.10	538	1.07	1.10	1497	1.46 ^{***}	1.39 ^{***}
LN(Total amount of prior bond issuance)	310	3.97	5.02 [*]	538	4.05	5.30	1497	5.18 ^{***}	6.11 ^{***}
Number of different lead underwriters used in prior 3-yr equity issuance	87	1.15	1	163	1.19	1	327	1.16	1
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	1497	0.18 ^{***}	0 ^{***}

* ** *** Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

Table V
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. When mean and median of a variable are reported, the difference between two types of underwriters in means is tested by *t*-test and the difference in medians by Wilcoxon rank-sum test. See Table I for the definition of each variable.

	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 ^{***}
Ln(total loans)	3.70 ^{***}	4.67 ^{***}	5.59	6.89	3.70 ^{***}	4.39 ^{***}
Ln(prestitigious bank loans)	3.17 ^{***}	3.71 ^{***}	5.04	6.29	3.24 ^{***}	0 ^{***}
Ln(underwriter loans)	1.84 ^{***}	0 ^{***}	3.08	3.99	-	-
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		1497	

^{*}, ^{**}, ^{***} Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

Table VI
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. The difference in percentage is tested by z-statistic with the null hypothesis that the proportions of particular issuer characteristic between syndicates are the same. See Table I for the definition of each variable.

	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 firm	276	89.0	490	91.1	1326	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***
Non-investment grade	50	16.1***	139	25.8	211	14.1***
S&P stock ranking: 7-9	82	26.5	133	24.7	589	39.4***
S&P stock ranking: 16-18	149	48.1**	219	40.7	502	33.5***
S&P stock ranking: 21-22	12	3.9	12	2.2	44	2.9
S&P stock ranking: non-rated	67	21.6***	174	32.3	362	24.2***
Total Observations	310		538		1497	

***, **, * Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

Table VII
Estimates of the Determinants of Syndicate Decisions

This table reports the pair-wise probit estimates and the values of z-test of syndicate decisions. The syndicate decision equations are presented in Section II. The column under the heading of "Hybrid vs. Pure-IB" reports the syndication decision of investment banks. The dependent variable, hybrid, is 1 if investment banks allow commercial banks to participate in the investment bank lead syndicate, 0 if investment banks exclude commercial banks in the syndicate. The subsample used for investment syndication decision is bond issues underwritten by Hybrid and by Pure-IB syndicates. The column under the heading of "Hybrid vs. CB-Lead" reports the syndication decision of commercial banks. The dependent variable, hybrid, is 1 if commercial bank participates in an investment bank lead syndicate, 0 if commercial bank leads the syndicate. Therefore, I use the subsample of bond issues underwritten by Hybrid and by CB-Lead syndicates to estimate commercial banks' syndication decision. The column under the heading of "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. See Table I for the definition of each variable. The estimates for the time period dummies and constant terms are not reported though they are included.

Table VII (Continued)

Dependent Variable	Hybrid vs. Pure-IB		Hybrid vs. CB-Lead		CB-Lead vs. Pure-IB	
	(Hybrid = 1)		(Hybrid = 1)		(CB-Lead = 1)	
Independent Variables	Estimate	z-stat	Estimate	z-stat	Estimate	z-stat
<i>Prior 3-year security issuance</i>						
Ln(1+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+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 ^{***}
<i>Bank relationships</i>						
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*Underwriter loans	-	-	-0.14	-2.63 ^{***}	-	-
<i>Firm and issue characteristics</i>						
Ln(size of issue)	0.08	1.59	0.35	4.87 ^{***}	-0.34	-8.41 ^{***}
Ln(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 q	-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 ranking: 16-18	0.30	2.94 ^{***}	0.51	2.97 ^{***}	0.22	2.16 ^{**}
S&P stock ranking: 21-22	-0.17	-0.67	0.21	0.54	0.33	1.25
S&P stock ranking: non-rated	-0.07	-0.54	0.40	1.93 ^{**}	-0.06	-0.49
Credit rating: Aa	0.23	0.98	-0.04	-0.08	0.02	0.07
Credit rating: A	0.03	0.15	-0.50	-1.04	0.003	0.01
Credit rating: Baa	0.05	0.22	-0.68	-1.35	-0.07	-0.26
Non-investment grade	0.18	0.67	-0.32	-0.59	0.04	0.15
Pseudo-R ²	0.36		0.45		0.21	
No. of observations	2035		848		1807	

^{*}, ^{**}, ^{***} Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

Table VIII
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 U.S. Treasury security of comparable 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. Endogenous selection terms used to control the endogenous selection biases arise from the syndicate decisions are defined in Section II and estimated from the first-stage probit estimation in Table VII. Endogenous selection (1) is $\frac{\phi(Z_A\gamma_A)}{1-\Phi(Z_A\gamma_A)}$, (2) is $\frac{\phi(Z_B\gamma_B)}{1-\Phi(Z_B\gamma_B)}$, (3) is $\frac{-\phi(Z_A\gamma_A)}{\Phi(Z_A\gamma_A)}$, (4) is $\frac{-\phi(Z_C\gamma_C)}{\Phi(Z_C\gamma_C)}$, (5) is $\frac{-\phi(Z_B\gamma_B)}{\Phi(Z_B\gamma_B)}$, and (6) is $\frac{\phi(Z_C\gamma_C)}{1-\Phi(Z_C\gamma_C)}$. The corresponding coefficients are the estimates of σ_{A1} , σ_{B1} , σ_{A2} , σ_{C2} , σ_{B3} , and σ_{C3} , respectively. See Table I for the definition of each variable. 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 non-rated.

Table VIII (Continued)

Independent Variables	Hybrid (1)		Hybrid (2)		Pure-IB		CB-Lead	
	Estimate	<i>t</i> -statistics	Estimate	<i>t</i> -statistics	Estimate	<i>t</i> -statistics	Estimate	<i>t</i> -statistics
Ln(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(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(Underwriter loans)	0.31	0.20	-0.39	-0.28	-	-	-4.41	-2.06**
REFBD*Ln(Underwriter loans)	-2.42	-1.13	-2.54	-1.31	-	-	4.64	1.41
Ln(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**
REFBD* interest expense	0.06	0.26	0.02	0.08	-0.02	-0.39	0.37	1.34
Ln(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		1195		246	

*, **, *** Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

¹ For discussions on the Section 20 Subsidiaries and regulatory environment and remedy regarding bank underwriting, see J.P Morgan & Co. Inc., The Chase Manhattan Corp., Bankers Trust New York Corp., Citicorp, and Security Pacific Corp., Federal Reserve Bulletin 75 (1989): 192-217.

² See Ang and Richardson (1994), Puri (1994), Puri (1996), Gande, Puri, Saunders, and Walter (1997), Song (2002), and Roten and Mullineaux (2002) for prior empirical results in bank underwriting.

³ See Page 282 and Chapters 8 and 9 in Maddala (1983) for the explanation of the model and related issues. In addition, as one could see from the previous discussions, commercial banks and investment banks could be different in many ways, which indicates that the formal testing of this strategic syndication hypothesis involves many proxy variables. I will leave those discussions to Section I.

⁴ Commercial bank lead syndicates may or may not have other investment banks participate as co-managers. Although commercial banks may also cooperate with other commercial banks as a fourth type (Pure-CB), the sample size representing only 2.2% of the bond issues, is too small to conduct multivariate analysis. The data is lumped in with other commercial bank lead syndicates. Thus, I focus the discussions on three types of syndicates –Hybrid, Pure-IB and CB-Lead.

⁵ For empirical work on lending syndicate formation, see Preece and Mullineaux (1996). For the economic of syndication of venture capital investments, see Lerner (1994).

⁶ 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 example, Holland, 1994; James 1987).

⁷ The author is grateful to an anonymous referee for suggesting this fruitful direction of research.

⁸ See Ongena and Smith (2001) for the study of duration of intermediary-client relationships in bank lending. James (1992) documents that underwriters charge lower initial fees when they expect future deals with the same client because the marginal cost of repeating business with the same client is lower. See also Saunders and Srinivasan (2001) on the effect of a prior investment banking relationship on merger advisory fees.

⁹ I model these decisions as if underwriters are the ones determine the syndicate formation. However, it could be true that syndicate structure is driven by the demand of clients. 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. Therefore, the decision equations in the model can be viewed as the clients' syndicate selection decisions. 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.

¹⁰ 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, compared to fees, Song (2002) shows that net yields are the dominant factor determining underwriter selection at the lead underwriter level.

¹¹ 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.

¹² 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.

¹³ The multiple decisions in this model make the interpretations of these estimates much more difficult to comprehend compared to the one decision model. For interested readers, Chapters 8 and 9 in Maddala (1983) contain excellent discussions on the models regarding endogenous switching, the estimation, and the interpretation of these models.

¹⁴ Narayanan, Rangan, and Rangan (2001) also study commercial banks as co-managers but their focus is in the equity underwriting market. Besides, they do not examine the decision process of different types of syndicate formation and the empirical methodology employed is also different from this study.

¹⁵ The banks with Section 20 subsidiaries are the largest bank holding companies, such as J.P. Morgan, Chase Manhattan, Citicorp, etc. For a list of these banks as of May 31, 1997, see Gande, Puri, and Saunders (1999).

¹⁶ Effective on November 12, 1996, commercial banks are allowed to exclude the interest earned on the ineligible securities from the 10 percent revenue limit. This amendment would decrease the quarterly ineligible revenue of some Section 20 subsidiaries by a magnitude ranging between 19 percent and 79 percent. Since revenue limitations are calculated over a rolling eight-quarter period, commercial banks that anticipate this change could increase their underwriting activities in 1996. See Federal Register 61(1996): 48953-48954. Besides the revenue limitation is lifted from 10 to 25 percent at the end of 1996. See Federal Register 61 (1996): 68750-68756.

¹⁷ The new issue variable means to capture “a debt IPO.” Because the data in SDC Platinum starts from 1970, the sample in this paper starts from 1991, so I use 20 years to determine if there is any other bond issuance prior to the current issue. Besides, using 10 years as cutoff does not change

the results. The correlation between these two variable specifications is 0.95.

¹⁸ See Pinkowitz and Williamson (2001) for the study of bank power and cash holdings. For the studies of underwriter reputation and firm characteristics, see Titman and Trueman (1986) and Chemmanur and Fulghieri (1994).

¹⁹ Table VIII 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 same underwriters in prior equity issuance is significant in model (2) of Table VIII. However, that for CB-Lead syndicates remains insignificant without controlling for endogenous selections, thus the results are not reported.

²⁰ The endogenous selection term (4), $\frac{-\phi(Z_c\gamma_c)}{\Phi(Z_c\gamma_c)}$, is always negative, so the positive estimate of

σ_{c2} indicates lower net yields.