This is to certify that the

dissertation entitled

**TWO ESSAYS ON REPEALING GLASS-STEAGALL ACT:
REGULATION DISTORTION AND BANKS' ENTRY
IN SECURITY UNDERWRITING**

presented by

Wei-ling Song

has been accepted towards fulfillment
of the requirements for

_____Ph.D._____ degree in ___Finance___

_____
Major professor

Date _8/18/99_

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.
MAY BE RECALLED with earlier due date if requested.

DATE DUE	DATE DUE	DATE DUE

TWO ESSAYS ON REPEALING GLASS-STEAGALL ACT: REGULATION
DISTORTION AND BANKS' ENTRY IN SECURITY UNDERWRITING

By

Wei-ling Song

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Finance

1999

T

This c

Act o

secur

unde

exam

secu

perce

bank

requi

recei

regu

sma

poss

serv

have

prov

is co

ABSTRACT

TWO ESSAYS ON REPEALING GLASS-STEAGALL ACT: REGULATION DISTORTION AND BANKS' ENTRY IN SECURITY UNDERWRITING

By

Wei-ling Song

This dissertation investigates the economic impact of repealing Glass-Steagall Act of 1933 on financial industry. The Act prohibits commercial banks from security underwritings. In 1987, commercial banks are allowed to engage in underwriting and dealing certain securities on a limited basis. The first essay examines three questions regarding commercial banks' involvement in the security underwriting business in the post-section 20 era: (i) how does the ten percent revenue limitation distort the underwriting activities of commercial banks?, (ii) how different commercial banks are from investment banks under the regulatory and market conditions?, and (iii) which types of issuing firms do receive benefits from the bank-entry? We find evidence consistent with the regulatory distortion explanation that commercial banks are actively engaging in small issue market. Compared to investment banks, commercial banks do not possess better ability in underwriting for small issuers. In fact, they are better in serving large clients but they can not handle large issue size. Commercial banks have better informational advantage. The association with commercial banks provides value to issuing firms. However, the evidence supports that the market is concerned for conflicts of interest and informational monopoly power of

commercial banks. Due to the pros and cons of commercial banks, only issuers with middle credit ratings receive significant benefits from bank entry. Whereas, small issuers with high credit ratings and large issuers with low credit ratings are suffered from the banks' expansion at the later entry stage.

In the second essay, we examine empirically the economic rationales of coalitions of underwriters and the role of commercial banks as co-managers when they expand into the security underwriting business. We find evidence that commercial banks strategically select their mode of entry, either by leading the syndicates or by participating in syndicates led by an investment bank (the hybrid form), depending on their underwriting strength in different markets. By cooperating with a reputable investment bank, commercial banks can effectively reduce their conflicts of interest problem while preserving their informational advantages. The creation of a better organizational form in conducting security underwriting provides economic incentives for investment banks to accommodate the entry of commercial banks. The distinct functions offered by commercial banks facilitate their penetration into the security underwriting industry. In most cases, the hybrid structure is superior to both the commercial bank lead syndicate and to the pure investment bank arrangement. This paper highlights shortcomings of previous work in this area that focus only on issues that are commercial bank lead. By neglecting other organizational forms, such as hybrid syndicates, previous research understates the benefits that commercial banks bring into the security underwriting business.

To my parents, daughter and son.

comm

Dr. C

espec

comm

continu

for offe

wisdom

Cichello

deeply

provide

A spec

care of

family f

gratitud

and sac

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (CONT'D)

1.1

R

financi

to repe

prohibi

of this a

investm

Th

banks t

subsidi.

' See. fo
the Hou
Financia
between
(Congre
² See J.
Corp.. C
(hereaft
limitatio
the Fed
principa
revenue
and dea
subsidia
and dea
comme.
Firewall
the sec
of intere
proceed

ESSAY 1. BANK-ENTRY BENEFITS AND REGULATION DISTORTION IN THE CORPORATE SECRURITY UNDERWRITING BUSINESS

1.1   Introduction

Recently, Congress and regulators have undertaken measures to reform the financial services industry. These efforts include, among other things, a proposal to repeal the Glass-Steagall Act[1]. The Glass-Steagall Act of 1933 effectively prohibited commercial banks from underwriting corporate securities. As a result of this act, all U.S. corporate security issues could be underwritten only by investment banks for nearly six decades.

The relaxation of the Glass-Steagall Act since 1989 has allowed commercial banks to engage in these investment banking activities through their Section 20 subsidiaries under firewall restrictions and a 10 percent revenue limitation[2]. The

---

[1] See, for instance, the bill (H.R. 1062) proposed by Representative Leach, Chairman of the House Banking Committee, on February 27, 1995. In general, H.R. 1062, the Financial Services Competitiveness Act of 1995, is intended to permit affiliations between full-service depository institutions and full-service securities companies (Congressional Reports, 1995-1996, House Reports 104-127).

[2] See J.P Morgan & Co. Inc., The Chase Manhattan Corp., Bankers Trust New York Corp., Citicorp, and Security Pacific Corp., 75 Federal Reserve Bulletin 192 (1989) (hereafter, 1989 Order) for a discussion of Section-20 subsidiary, firewall and revenue limitation. Basically, Section 20 of the Glass-Steagall Act states that a member bank of the Federal Reserve System may not be affiliated with a company that is "engaged principally" in underwriting and dealing in securities. The Board has established a revenue test to determine whether a company is "engaged principally" in underwriting and dealing for purposes of section 20. The revenue test provides that a section 20 subsidiary may not derive more than 10 percent of its total revenue from underwriting and dealing in bank-ineligible securities. Bank-ineligible securities refer to the ones commercial banks are allowed to deal and underwrite after the change of regulation. Firewalls are a set of restrictions that limit the financial and information flows between the securities and commercial bank subsidiaries in an effort to insulate potential conflicts of interest that commercial banks may pass off bad loans to the market and use the proceeds to pay off bank debt.

10 p

bank

bank

1996

banks

merge

In

comm

issues

from th

materia

Additio

distortio

this pap

commer

Gar

1989. ar

the perio

bringing

the firm s

[3] See Fede

Activities o

Dealing in

10 percent revenue limitation effectively eliminates the possibility that commercial banks may enter the securities business by acquiring an existing investment bank. Following the increase of the revenue limitation to 25 percent at the end of 1996[3], there were some mergers between commercial banks and investment banks, such as Bankers Trust's merger with Alex, Brown, Inc. and Citicorp's merger with Travelers.

In contrast to investment banks who do not have any revenue constraint, commercial banks may be limited by this revenue restriction in the amount of issues they can underwrite. This restriction might also cause them to deviate from the clientele they can serve the best. Whether the revenue limitation has material effects on the behavior of commercial banks has yet to be investigated. Additionally, it is unclear if issuing firms are suffering from possible regulation distortion. Besides the observed distortion of bank entry modes, we analyze in this paper the impact of revenue restriction on the underwriting ability of commercial banks and their client firms.

Gande et al (1997) studied commercial bank underwriting activities since 1989, and found that the issue size of commercial bank clients decreased during the period 1993-95. The authors argue that commercial banks are better in bringing smaller firms into the public debt market. However, they do not examine the firm size explicitly in the their study. Although it is true that the issues of small

---

[3] See Federal Reserve System Docket No. R-0841, "Revenue Limit on Bank-Ineligible Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and Dealing in Securities."

firms tend to be smaller[4], the matching of issuer and underwriter based on these two dimensions of size depends on the different abilities of underwriters. The *firm size* dimension is associated with the certification ability of underwriter, whereas *issue size* is related to the distribution ability of underwriter. These two abilities may not have a perfect correlation with each other, like the positive relationship between issue size and firm size. In addition, the 10 percent revenue limitation imposed only on commercial banks may hinder their ability in handling large issue size, even though they may be better in serving large firms.

Using a sample of 1327 corporate bond issues from 1991 to 1996, we formally examine the abilities of commercial banks and investment banks in assisting issuers with different issue sizes and firm sizes. We test the hypothesis that commercial banks actively engage in the small issue market because of regulatory distortions rather than because of commercial banks' superior ability in underwriting for small firms.

Since commercial banks are new entrants in the security underwriting business, one might argue that they are at a disadvantage with respect to distribution capabilities, because it takes time to establish distribution networks. If this is true, we should observe commercial banks improve their distributional ability over time. So, we examine the performance of commercial banks in serving their clients across different time periods. We also segment the total underwriting market by the median issue size to further investigate the differences of commercial bank underwriting between large and small issue

---

[4] The correlation coefficient between these firm size and issue size is 0.34.

mark

pron

B

banks

disadv

assoc

monito

informa

provide

Howev

banks

to captu

Rajan (

An

which is

1933. K

commer

the com

off bad l

debt. De

[5] See Jam
association

markets. The regulatory distortion from the revenue constraint should be more pronounced in the large issue market than the small issue market.

Besides regulatory differences between commercial banks and investment banks, there have been extensive debates regarding the advantages and disadvantages of banks as lenders and underwriters. The advantages of bank association have been the subject of much theoretical and empirical work[5]. The monitoring activity of a bank gives commercial banks a role as credible information certifiers (Fama, 1985, Diamond, 1991). Bank relationships may also provide insurance against credit rationing when times are tough (Holland, 1994). However, the informational role of commercial banks comes with a cost, since banks can acquire monopoly power over clients' information, allowing the banks to capture a greater share of firm profits. Issues of this sort are discussed in Rajan (1992), Sharpe (1990) and Greenbaum et al (1989).

Another disadvantage of commercial banks is a potential conflict of interest, which is the main concern prompting the passage of the Glass-Steagall Act in 1933. Kanatas and Qi (1998) study the cost of conflicts of interest imposed on commercial bank clients when the investors suspect that there is a potential for the commercial banks to misrepresent the quality of their customers and to pass off bad loans to the market, enabling the firm to use the proceeds to repay bank debt. Despite this cost, firms may choose to use the services of commercial

---

[5] See James (1987) and Billett et al (1995) for empirical evidence on the value of bank association.

bank

unde

differe

banks

we sh

econc

specia

These

monop

We

differen

estimat

based

each fir

from ea

systema

the bon

[6] For mo
Steagall
York Cor
[7] See An
Gande e
results. M
commerc
concerns

banks if there are sufficiently large scope economies in combined lending and underwriting[6].

The existing empirical literature[7] does not provide convincing evidence that different types of underwriters have comparative advantages. If commercial banks as a group possess different abilities than those of investment banks, then we should observe a corresponding specialization in different segments of the economy. By using appropriate proxy variables, we further separate the test of specialization and comparative advantages of underwriters into finer hypotheses. These hypotheses include informational and relationship advantages, information monopoly power, and conflicts of interest of commercial banks.

We test if there is a systematic selection of underwriters. We compare the differences between commercial banks and investment banks explicitly by estimating their bond pricing (net yield) equations and discuss these differences based on the above finer hypotheses. The regression coefficient differential on each firm or issue characteristic reveals how these two underwriters are different from each other on this particular dimension of issuers. Given that there is a systematic selection, this potential selection bias needs to be controlled for when the bond pricing equations are estimated.

---

[6] For more detailed discussions of the arguments for and against the repeal of Glass-Steagall Act, see 1989 Order and Citicorp, J.P. Morgan & Co., and Bankers Trust New York Corp., 73 Federal Reserve Bulletin 473 (1987).

[7] See Ang and Richardson (1994), Puri (1994), Puri (1996), Hamao and Hoshi (1997), Gande et al (1997), and Kroszner and Rajan (1997) for more discussions of empirical results. Most of these studies support the view that there is a net certification effect of commercial banks. Only the study by Kroszner and Rajan (1997) showed there were concerns for conflicts of interest of commercial banks in the market.

regre

choic

and c

betwe

bond

under

bond p

under

clients

the iss

yield.

previo

under

F

under

that d

be be

switc

from

role t

analy

[a] See

This leads to a natural application of the empirical model of switching regressions with endogenous switching[8]. The model consists of an underwriter choice equation, and two bond yield equations, one for commercial bank clients and one for investment bank clients. Thus, we allow complete interactions between issuer characteristics and underwriter identity when we estimate the bond pricing equations to contrast the differences between these two types of underwriters. In addition to disentangling the forces underlying the formation of bond prices, this model also allows us to compare the performance of underwriters by quantifying the benefits that different underwriters create for their clients. The benefit is defined as the expected mean net yield of the issuer had the issue been underwritten by the unselected underwriter, less the actual net yield. Instead of comparing the net yields of different regimes of issuers as in previous studies, we are able to compare a firm's net yield given the selected underwriter, to the net yield had the client chosen the unselected underwriter.

Firms with different characteristics may have a variety of different needs for underwriting services. These needs should be matched with the varied abilities that different underwriters possess. Thus, the entry of commercial banks could be beneficial to certain types of firms. On the other hand, the existence of switching costs (Nanda and Warther, 1998) may prevent commercial bank clients from using services of investment banks. Therefore, we investigate the economic role that commercial banks play in the security underwriting business and analyze what types of firms are better off or worse off due to the bank entry.

---

[8] See Maddala (1983) for an explanation of this model.

sma

segm

The

bank

Furth

the fir

bank

increa

banks

the sar

choose

inability

clients.

perform

later ent

T

choice o

empirica

have fac

trade less

Tobin's q

associatio

It appears from our results that commercial banks actively participate in the small issue market because of regulatory constraints, rather than being in this segment voluntarily due to any comparative advantage in assisting small issuers. The results of the overall sample show that the underwriting ability of commercial banks is better than that of investment banks along the firm size dimension. Furthermore, in the large-issue market, the differences between underwriters in the firm size dimension are more pronounced. However, these large commercial bank clients incur huge price discounts when the size of their bond issues increases; this is not true for investment bank clients. The ability of investment banks to serve different size of customers, regardless of firm size or issue size, is the same in both small and large issue markets. If commercial banks could choose, they would have underwritten a greater number of larger clients, but their inability to handle large issue sizes prohibits them from underwriting for large clients. This regulatory distortion hypothesis is further supported by the performance of commercial banks, which worsen in the large issue market at the later entry stage.

This paper also establishes empirically that the forces underlying the choice of underwriter for security issuance suggested by previous theoretical and empirical work do exist. The informational advantage that commercial banks have facilitates their underwriting firms that are less risky (lower leverage), that trade less frequently, are rated lower and that have higher Tobin's q. Since Tobin's q may be a proxy for investment opportunities, the commercial bank association with high Tobin's q clients also supports the notion that a commercial

7

bank

relati

that b

rated

ability

(finan

increas

investr

comme

results

informa

by the s

are stror

the bene

informati

We f

interest e

banks. es

find the in

interest. Ir

[3] Cherry pic

based on th

explanation

bank relationship is beneficial to firms with higher financing needs. The positive relation between lower rated issuers and commercial banks supports the views that bank monitoring and certification are more valuable to firms in this segment.

Besides their observed specialization in underwriting for less risky, lower rated firms with higher informational problems, commercial banks have a better ability than investment banks in underwriting along the dimensions of leverage (financial risk) and Tobin's q. When the leverage and Tobin's q of client firms increase, commercial bank underwritten bonds have lower net yields than investment bank underwritten bonds. Further, we present evidence to show that commercial banks can cherry pick[9] from among available client firms. These results are consistent with the hypothesis that commercial banks have informational and relationship-based advantages. When we separate the sample by the size of issue, the informational advantage and bank relationship effects are stronger in the small issue market. Not surprisingly, in the large issue market, the benefits of bank association decrease because these issuers have less of an informational problem and better access to the capital markets.

We find that the concerns for conflicts of interest rise when firms having high interest expense relative to operating income are associated with commercial banks, especially when the purpose of issue is to repay bank debt. We do not find the intent to refinance bank debt by itself a proxy for potential conflicts of interest. In fact, when the use of proceeds is for refinancing bank debt and the

---

[9] Cherry picking refers to the ability of commercial banks to select "higher quality" firms based on their private information about clients. See Section 1.3 for a detailed explanation of how the endogenous selection of firms ties into the cherry picking ability

leve!

of un

infor

high s

A

than

banks

marke

range

with ve

entry ir

that the

and inte

rated sr

"locked-

T

hypothe

discusse

presents

regulatoi

investme

level of interest expense is low, there is no price discount of the bond regardless of underwriter. We also document that the market is concerned about the informational monopoly problem with commercial banks, especially for firms with high stock return volatility, high profitability and higher past sales growth.

Although it appears that the benefits created by investment banks are larger than those created by commercial banks, this does not mean that investment banks are better underwriters than commercial banks across all segments of the market. Consistent with Diamond (1991), firms with credit ratings in a middle range receive the most benefits from commercial bank relations. However, firms with very high and very low credit ratings do not benefit from commercial bank entry in general. The results are also consistent with the theory in Rajan (1992) in that there is a trade-off in developing relationship-specific capital between firms and intermediaries. Negative benefits created by commercial banks for the best rated small issuers implies that these smaller, better firms are the clients being "locked-in".

The rest of the paper is organized as follows. In Section 1.2, the testable hypotheses, empirical proxies and prediction of underwriter choice are discussed. Section 1.3 motivates and describes our empirical model. Section 1.4 presents the data and descriptive statistics. Section 1.5 reports the effects of regulatory distortion and the comparative advantages of commercial banks and investment banks. Section 1.6 concludes.

---

underwriters.

9

1.2

Th...

studie...

1994:...

subsid...

and Ra...

better...

acquire...

find ev...

underw...

informa...

suppor...

concer...

Non...

betwee...

problem...

advanta...

issuing...

different...

In the...

compara...

1.2 Testable Hypotheses, Empirical Proxies and Prediction of Underwriter Choice

The role of commercial banks as both lenders and underwriters has been studied using data both prior to the Glass-Steagall Act (Ang and Richardson, 1994; Puri, 1994; Puri, 1996; Kroszner and Rajan, 1997) and the post-section-20 subsidiary era (Gande et al, 1997). The results are mixed. Except for Kroszner and Rajan (1997), all the studies support the view that commercial banks are better certifiers of public debt issues because of informational advantages acquired from lending to issuing firms. Taken as a whole, these studies do not find evidence of conflicts of interest that lead commercial banks to systematically underwrite bad loans. Contrary to these findings, by controlling for the informational advantages of banks, Kroszner and Rajan (1997) report results that support the argument that when lending and underwriting are closely combined, concerns for conflicts of interest do exist.

Nonetheless, these studies do not address the issue of how firms select between different underwriters and do not control for the endogenous selection problem when the net yield equations are estimated. The comparative advantages of underwriters have never been investigated using characteristics of issuing firms. By using appropriate proxy variables, we are able to disentangle different forces that have material effects on bond pricing.

In the following subsections, we discuss the hypotheses related to the comparative advantages of underwriters; the firm and issue characteristics can

be us

Theo

summ

advar

banks

1.2.1

Th

banks

This inf

more se

with hig

banks a

with larg

produce

probabili

greater g

In Di

ones with

firm with

commercia

and Chem

be used to test these hypotheses along with the prediction of underwriter choice.

Theoretical predictions of underwriter choice from each hypothesis are

summarized in Table 1.1. These hypotheses include information and relationship

advantage, conflicts of interest, and information monopoly power of commercial

banks.

1.2.1 The Information Advantage Hypothesis

Through periodic monitoring and ongoing deposit histories, commercial

banks can acquire private information about their clients in a cost-effective way.

This information advantage gives banks a unique role in serving issuers with

more serious information problems (Fama, 1985; James, 1987). Therefore, firms

with higher information asymmetry receive greater benefits by using commercial

banks as their underwriters. The information problem is more severe for firms

with larger growth opportunities. Commercial banks as low cost information

producers are more beneficial for smaller firms than larger ones. Therefore the

probability of choosing a commercial bank is higher if the firm is smaller, has

greater growth opportunities, and has a lower credit rating.

In Diamond (1991), bank monitoring provides value to firms, especially to the

ones with credit ratings in the middle range. Therefore, we should observe that

firm with credit ratings in the middle range tend to be associated more with

commercial banks than with investment banks. Both Titman and Trueman (1986)

and Chemmanur and Fulghieri (1994) model the effects of underwriters with

inform

the m

tends

inform

proce

inform

higher

are ex

opport

market

firm siz

depend

1.2.2

The

both emp

conflicts

the publi

[10] Exchang
sample is
[11] See App
[12] For deta
as both len
Corp., Ban
Reserve Ba

information advantages. They conclude that the higher the quality of underwriter, the more effective it is in reducing the impact of information asymmetry and it tends to reject a firm with a risky project. Consequently, underwriters with better information underwrite less risky client firms and obtain a higher price (net proceeds) for the underwritten security. Given that commercial banks possess an information advantage, the probability of choosing one as an underwriter is higher if the firm is less risky. The empirical proxies for information asymmetry are exchange listing[10], volatility of equity return, equity trading volume, growth opportunity (measured by Tobin's q, sales growth), and firm size (defined as the market value of equity). The proxy related to information cost effectiveness is the firm size. The variables for credit ratings are defined in two different ways depending on the purpose of use[11].

1.2.2   The Conflicts of Interest Hypothesis

The issue of conflicts of interest of commercial banks has been discussed in both empirical and regulatory literatures[12]. Due to the perception of greater conflicts of interest, it should be more difficult for commercial banks to convince the public of the value of these securities than for investment banks. As

---

[10] Exchange listing is dropped in the empirical analysis because only five percent of sample is not listed on an exchange.
[11] See Appendix A for more information.
[12] For detailed discussion of conflicts of interest and the concerns of commercial banks as both lenders and underwriters, see "J.P. Morgan & Co. Inc., the Chase Manhattan Corp., Bankers Trust New York Corp., Citicorp, and Security Pacific Corp.," 75 Federal Reserve Bulletin 192 (1989), Puri (1996), and Kroszner and Rajan (1997).

suggested by Kroszner and Rajan (1997), organizations with greater conflicts of interest should specialize more in issues with less information problems and less risk. Thus, firms possessing characteristics that might be viewed as causing conflicts of interest are less likely to choose commercial banks than investment banks as underwriters in order to avoid the price discount. The perceived conflict of interest should be higher for firms with higher risk and information asymmetry problems, with the most serious scenario being when the firm is also refinancing bank debt (Gande et al, 1997; Kroszner and Rajan, 1997). Therefore, the probability of choosing a commercial bank as an underwriter is smaller for firms with higher risk and information asymmetry problems and/or when the firm is refinancing bank debt. Given that the market is also using this information as proxies for potential conflicts of interest, the bond price of commercial bank clients should be lower than that of investment bank clients. The proxies used for risk are volatility of stock return, leverage, and interest expense relative to operating income; the predicted signs of probit estimates are negative[13].

---

[13] Although the predictions of underwriter selection are the same under both informational advantage and conflicts of interest hypotheses, the regression coefficients of net yield (BPS) regressions should be different. For instance, under the information advantage hypothesis, the beta coefficients of risk variables from commercial bank BPS regression should be smaller than that of investment bank BPS regression, because commercial banks can certify the information better than investment bank can. The commercial banks may reject the firm after the evaluation, so the association of commercial bank with riskier firm is lower, in Diamond (1991), monitoring of new, low quality borrowers can only be used as a screening device, many new borrowers will be turned down for credit because monitoring does not provide incentive for cooperative actions. This is an example that these three estimates in our empirical model does not agree with each other, because the selection is not determined by the bond yield differential. Whereas, under conflicts of interest hypothesis, the selection of underwriters shows the same pattern, the reverse is true for the estimates of bond pricing equations, since investors will require a price discount when the perceived conflicts of interest is more serious.

and B

anno

that li

agains

heterc

loans.

to be a

demar

select

more

T

and th

proxie

agains

future

1.2.3 The Bank Relationship Hypothesis

The value of bank relationships is documented in papers by James (1987) and Billett et al (1995). They find that the market response to bank loan announcements is positive. Holland (1994) points out in his case study research that lines of credit and borrowing limits on unsecured loans provide insurance against possible future credit rationing. But the value of the bank relationship is heterogeneous across firms. A cash rich and profitable firm relies less on bank loans, whereas unprofitable firms and firms experiencing high growth would like to be associated with banks because they may anticipate higher bank loan demand in the near future. This analysis thus leads to a lower probability of selecting commercial banks as underwriters by firms with more cash, that are more profitable and that anticipate slower growth.

The empirical proxy used for cash in this study is cash and cash equivalents, and the proxy for profitability is operating income before depreciation. Growth is proxied by 5-year sales growth and Tobin's q. Besides the insurance value against credit rationing, bank relationships could also provide better control of future agency and information asymmetry problems of firms.

A

flexib

outsic

power

future

circum

better

underv

have h

higher

are the

profitab

[14] See info
information
hypothesis
[15] The prox
the predicte

1.2.4 The Bank Monopoly Power Hypothesis

Although banks provide the benefits of information certification and financial flexibility, the benefits come with costs. Since firms cannot communicate with outsiders about future prospects credibly, the bank has temporary monopoly power over a firm's private information, allowing the bank to appropriate firms' future profits (Rajan, 1992; Sharpe, 1990; Greenbaum et al, 1989). In order to circumvent bank power, a firm with a greater information asymmetry problem[14], better prospects[15], and more free cash or higher profitability is less likely to be underwritten by a commercial bank. However, commercial bank clients tend to have higher cash reserve if the monopoly power of banks requires them to keep higher compensating balances. The empirical proxies for the information problem are the same as those in the information advantage hypothesis. The proxy for profitability is operating income before depreciation.

---

[14] See information advantage hypothesis for these proxies, the predicted signs under information monopoly hypothesis are opposite to that under information advantage hypothesis.

[15] The proxies are Tobin's q and sales growth, under information monopoly hypothesis, the predicted signs of probit estimates should be negative.

1.3

1.3.1

If

abilitie

that ca

bond

selecta

underv

selecti

selecti

consid

underw

A valid

and the

unselec

applica

explaine

which sl

regressi

advantag

1.3   The Switching Regression Model: Motivation and Description

1.3.1   Model Specification

If commercial banks and investment banks have different underwriting abilities, then, all else being equal, bond-issuing firms will select the underwriter that can obtain the higher bond price. Therefore, the observed distribution of bond prices underwritten by each type of underwriter is conditional on this selection. The bond prices that could have been obtained by the unselected underwriter are not observable. Thus, there is a need to control for this self-selection when the bond pricing (or net yield) equation is estimated. Due to this selection, commercial bank and investment bank underwritten issues may be considered as representing two distinct regimes. The bond prices of issues underwritten by different types of underwriters are no longer directly comparable. A valid comparison would be the difference between the observed bond price and the expected bond price, had the same firm been underwritten by the unselected underwriter. The underlying selection mechanism leads to an application of switching regression with endogenous switching. This model, explained in detail in Maddala (1983), consists of a probit model estimation, which shows the determinants of underwriter selection and two net yield regressions for each type of underwriter, which contrast the comparative advantages of different underwriters. Formally, our empirical model is as follows:

where

yield c

banks

vectors

equatic

$I_{,}$ =

$I_{,}$ =

$I_{,}$ is a c

its under

The

$y_{,}$ =

$y_{,}$ =

cor

The error

covariance

$$y_{1i} = X_i\beta_1 + u_{1i} \qquad \text{(1) (for CB underwritten issues)}$$

$$y_{2i} = X_i\beta_2 + u_{2i} \qquad \text{(2) (for IB underwritten issues)}$$

$$I_i^* = -(Z_i\gamma - \varepsilon_i) = -[X_i(\frac{\beta_1 - \beta_2}{\sigma_{u_{1i}-u_{2i}}}) - (\frac{u_{2i} - u_{1i}}{\sigma_{u_{1i}-u_{2i}}})] \text{(3) (underwriter choice equation)}$$

where CB stands for commercial banks, IB for investment banks, y_i is the net

yield of bond for firm i, subscript 1 refers to issues underwritten by commercial

banks, subscript 2 refers to those underwritten by investment banks, X_i, Z_i are

vectors of exogenous firm characteristics. The standard deviation $\sigma_{u_{1i}-u_{2i}}$ in

equation (3) is the standard deviation of $u_{1i} - u_{2i}$.

$$I_i = 1 \quad \text{iff} \quad I_i^* > 0 \qquad\qquad \text{(4)} \ (y_{1i} < y_{2i})$$

$$I_i = 0 \quad \text{iff} \quad I_i^* \le 0 \qquad\qquad \text{(5)} \ (y_{1i} \ge y_{2i})$$

I_i is a dummy variable taking the value 1 if firm i chooses a commercial bank as

its underwriter, and 0 otherwise.

The observed y_i is defined as

$$y_i = y_{1i} \quad \text{iff} \quad I_i = 1 \qquad\qquad \text{(6)}$$

$$y_i = y_{2i} \quad \text{iff} \quad I_i = 0 \qquad\qquad \text{(7)}$$

$$COV(u_{1i}, u_{2i}, \varepsilon_i) = \begin{bmatrix} \sigma_{11}\sigma_{12}\sigma_{1\varepsilon} \\ \sigma_{12}\sigma_{22}\sigma_{2\varepsilon} \\ \sigma_{1\varepsilon}\sigma_{2\varepsilon}1 \end{bmatrix} \qquad\qquad \text{(8)}$$

The error terms $u_{1i}, u_{2i}, \varepsilon_i$ are trivariate normal with means (0, 0, 0) and

covariance matrix defined as equation (8). Since firms will select the underwriter

who

for the

firm's

The c

the fol

E

$E($

where

distribu

The tes

equatio

advanta

We can

Case 1

and IB u

$E(y_{2i})$, r

than ave

those wh

are under

investmer

who can obtain the lowest possible yield, if $y_{1i} < y_{2i}$, they will have CB underwrite

for them, and we will observe y_{1i} instead of y_{2i}. If the converse is true, then the

firm's choice will be the IB, and we will observe y_{2i}.

The conditional mean net yields of CB and IB underwritten issues are given by

the following:

$$E(y_{1i} \mid I_i = 1) = X_i \beta_1 + \sigma_{1\varepsilon} \frac{\phi(Z\gamma)}{1 - \Phi(Z\gamma)} \qquad (9)$$

$$E(y_{2i} \mid I_i = 0) = X_i \beta_2 - \sigma_{2\varepsilon} \frac{\phi(Z\gamma)}{\Phi(Z\gamma)} \qquad (10)$$

where $\phi(\cdot)$ and $\Phi(\cdot)$ are, respectively, the Standard Normal density and

distribution functions.

The tests of endogenous selectivity bias are tests for $\sigma_{1\varepsilon} = 0$ and $\sigma_{2\varepsilon} = 0$ in

equations (9) and (10). If the endogenous selection is based on comparative

advantage, then $\sigma_{1\varepsilon} - \sigma_{2\varepsilon}$ is less than zero, but $\sigma_{1\varepsilon}$ and $\sigma_{2\varepsilon}$ can have any sign.

We can consider the following cases:

Case 1 : $\sigma_{1\varepsilon} < 0$, $\sigma_{2\varepsilon} > 0$ In this case the conditional mean net yields of both CB

and IB underwritten issues are less than their unconditional means $E(y_{1i})$ and

$E(y_{2i})$, respectively. Thus, those who choose commercial banks are better off

than average firms if all firms are underwritten by the commercial banks, and

those who choose investment banks are better off than average firms if all firms

are underwritten by investment banks. Here, both commercial banks and

investment banks specialize in certain segments of the market that cannot be

explai

becau

inform

Case 2

underv

conditi

the unc

are bet

better c

who ch

underw

banks c

Case 3:

Case 4:

because

issues a

1.3.2 E

Equa

particula

dimensio

explained by the publicly known firm characteristics. They coexist in the market because they possess distinct technologies in resolving the problem of private information of issuers. This is the best scenario for the economy.

Case 2: $\sigma_{1\varepsilon} < 0$, $\sigma_{2\varepsilon} < 0$ Here, the conditional mean net yield of commercial bank underwritten issues is less than the unconditional mean $E(y_{1i})$, and the conditional mean net yield of investment bank underwritten issues is greater than the unconditional mean $E(y_{2i})$. Therefore, those who chose commercial banks are better off than average firm underwritten by both underwriters, but they are better off underwritten by commercial banks than by investment banks. Those who choose investment banks are below average firms, but they are better off underwritten by investment banks than by commercial banks, i.e. commercial banks can cherry pick the firms when they provide the underwriting services.

Case 3: $\sigma_{1\varepsilon} > 0$, $\sigma_{2\varepsilon} > 0$ This is simply the reverse of Case 2.

Case 4: $\sigma_{1\varepsilon} > 0$, $\sigma_{2\varepsilon} < 0$ Given the setup of the model, this is impossible, because this implies that firms choose underwriters who underwrite the bond issues at higher yields, or lower bond prices.

1.3.2   Estimation and Interpretation of Regression Estimates

Equation (3) is parallel to a probit estimation equation. If $\beta_1 < \beta_2$ for a particular variable, then a commercial bank has a comparative advantage on this dimension of the firm over an investment bank, so the probit estimate will be

19

positiv

coeffic

of unda

advan:

exoger

selecti

explain

as a pr

measur

informa

Of

of unde

get this

be client

of underv

Besides,

forces, n

described

Th

instance,

firms, the

[16] The proc
[17] We will la

positive $(-(\beta_1 - \beta_2) > 0)$ for that characteristic. Comparison of these beta

coefficient differentials and the signs of probit estimates can identify the abilities

of underwriters and the determinants of underwriter selection. The comparative

advantages of different underwriters can be then established through these

exogenous variables. The adjustment terms used to control the endogenous

selection can be used to examine the underlying selection that cannot be

explained by those exogenous variables. Therefore, these terms can be viewed

as a proxy of private information or overall ability of underwriters that cannot be

measured by the exogenous variables, which are the publicly available

information.

Of course, the model has its limitations; if the forces that influence the choice

of underwriters cannot be explained by the price effect differential, we may not

get this relationship among these three estimates. An example of this force would

be client switching costs where, due to temporary informational monopoly power

of underwriter, the client may not be able to switch to preferred underwriters.

Besides, the ultimate decision of underwriter choice is the net result of these

forces, not just one of them. We follow the two-stage estimation procedure

described in Maddala (1983)[16] to estimate the parameters β_1, β_2, $\sigma_{1\varepsilon}$ and $\sigma_{2\varepsilon}$.

The framework of two net yield regressions is essential to our study[17]. For

instance, if commercial banks possess better ability in underwriting for large

firms, the beta coefficient of firm size from the net yield regression will be smaller

---

[16] The procedure is discussed in Chapter 8 of Maddala (1983), pp.: 224-8.
[17] We will label these net yield regressions as BPS regression for commercial bank (CB)

20

for cc

increa

more t

banks

model

transla

comme

based c

and the

    If

assumin

$\beta_1 = \beta_2$ [18]

firm size

different

an empir

the theore

have bee

and BPS re

[18] In the pa

Heckman's

consist of o

first-stage p

regression.

that the abil

the same. a

proxied by t

underwriters

for commercial bank clients than for investment bank clients. In other words,

increasing firm size reduces the net yield of commercial bank underwritten issues

more than that of investment bank underwritten issues. Therefore, commercial

banks are better off underwriting for large firms than for small firms. Based on our

model specification, *ceteris paribus*, the beta coefficient differential $(\beta_1-\beta_2)$ should

translate into a positive relation $(-(\beta_1-\beta_2)>0)$ of firm size and selection of

commercial banks as underwriters. We classify as exogenous the selection

based on the interactions between the publicly known characteristics of the firm

and the identity of its underwriter.

If we use only one net yield equation for both types of underwriters, we are

assuming there is no exogenous selection, that is, we are imposing the restriction

$\beta_1=\beta_2$ [18]. Therefore, regardless of underwriter identity, the bond price effect of

firm size is the same. Firms receive different bond prices because they have

different sizes; this has nothing to do with the identity of their underwriters. Thus,

an empirical model with only one net yield equation does not strictly follow from

the theoretical literature. This inconsistency might explain why previous studies

have been unable to provide a role for investment banks to exist and survive in

and BPS regression for investment bank (IB) for the remaining paper.

[18] In the paper of Puri (1996) and Gande et al (1997), they use the framework of Heckman's two-step method and two-stage tobit model, respectively. The models consist of one probit selection equation and one bond pricing equation. They use the first-stage probit estimates to control the selection bias in the second-stage bond pricing regression. Therefore, their models can be viewed as a restricted version of our model that the ability of different types of underwriters in certifying public information of firms is the same, and the only difference between these underwriters is the private information, proxied by the probit estimates, which can be revealed only by the identity of underwriters.

the p

inves

A

have s

engag

benefi

is give

$E(y_s,$

Th

comme

underw

rather tl

The

indepen

endoger

thus the

adjustme

multicolli

estimated

long term

empirical

'⁹ See pag

the pre-Glass-Steagall era when commercial banks were competing with investment banks more freely.

Another advantage of this three-equation model is that, given that we do have selection between underwriters, the benefit of allowing commercial banks to engage in the securities underwriting business can be quantified. The gross benefit for firm i underwritten by commercial bank rather than by investment bank is given by the following equation:

$$E(y_{2i} \mid I_i = 1) - y_{1i} = X_i \beta_2 + \sigma_{2\varepsilon} \frac{\phi(Z\gamma)}{1 - \Phi(Z\gamma)} - y_{1i} \quad (11)$$

The first term in equation (11) represents the expected mean net yield of commercial bank underwritten issues, had they chosen an investment bank as underwriter. The gross benefit for firm i underwritten by an investment bank rather than by commercial bank can be defined similarly.

Theoretically the switching regression model can be identified if the independent variables are the same for the three-equation system, because the endogenous adjustment terms estimated from probit regression are nonlinear, thus the rank condition for identification can still be satisfied. However, if the adjustment terms are not nonlinear enough, then we may encounter serious multicollinearity problems at the second stage when the net yield equations are estimated[19]. Therefore, in the probit estimation, we use cash and reduction of long term debt as instrumental variables (IV) to improve the identification of our empirical estimation. In order to be a valid IV in the current study, the variable

---

[19] See page 271 in Maddala (1983) for more discussions.

shou

no ex

firm c

[20] As it is
accumu
debt. Th
cash res

should be related to the underwriter-choice decision, and at the same time, have

no explanatory power on the yield of new bond issues after all other essential

firm characteristics are controlled for[20].

---

[20] As it is discussed in Opler et al (1999), firm maintains a surplus of internal funds, it accumulates cash and pays back debt when it becomes due. Cash is simply negative debt. Therefore, both cash and reduction of long term debt are used to proxy the level of cash reserves of firms.

T

corpo

New Is

insuffic

comme

study b

allowed

have m

the sam

and nor

both iss

and Cor

from the

The

useful ne

to 2224 .

eliminate

relative t

57, 31, 8

reduces

equity tra

1.4   Data and Descriptive Statistics

The data used in this paper consist of fixed-rate nonconvertible domestic corporate bond issues from the Securities Data Corporation (SDC) U.S. Debt New Issues database. Equity issues are not included in the study mainly due to insufficient sample size. There are only 15 common stock issues underwritten by commercial banks within the 12 months ended February 1997, according to the study by Bhargava and Fraser (1998). Although commercial banks have been allowed to underwrite corporate equity issues since 1989, the data are too few to have meaningful results. Therefore, we only use corporate bond issues during the sample period from January 1, 1991 to December 31, 1996. Only non-utility and non-financial firms are used in the analysis. To be included in the sample, both issue characteristics and firm characteristics must be available from SDC and Compustat databases respectively. Stock return data of issuers is collected from the CRSP Stock files.

The initial data contains 2935 bond issues. After we delete issues without useful net yield, purpose of issue and maturity data, the sample size is reduced to 2224 observations. The requirements for calculation of volatility of stock return eliminates an additional 604 observations; those for cash, interest expense relative to operating income, sales growth, and total debt to total asset eliminate 57, 31, 82, and 14 issues, respectively. The *market value of equity* variable reduces another 55 issues from the remaining sample. Finally, missing data for equity trading volume and reduction of long-term debt variables eliminate 28 and

24

26 o

All va

prior t

are m

reduct

daily e

which

the CR

Detaile

The

for each

present

banks,

period.

firms of

of inves

comme

level. C

---

[21] There

operatir

used ze

[22] The f

number

that we

reduces

26 observations respectively. The final sample consists of 1327 observations[21].

All variables constructed from Compustat are measured at the end of the year

prior to the bond offering. Market value of equity and trading volume of issuers

are measured at the end of the month preceding the bond issue. The variable

reduction of long term debt is measured in the year of bond issuance. Volatility of

daily equity return is proxied by the variance of residuals from the market model,

which is estimated over 120 trading days prior to the issuing date. The return on

the CRSP value-weighted index is used to proxy domestic market returns.

Detailed definitions of each variable are listed in Appendix A.

The frequency of bond issues and summary statistics of selected variables

for each year by type of underwriter during the period 1991 to 1996[22] are

presented in Table 1.2. The proportion of bonds underwritten by commercial

banks, which is 4.2% in 1991, grows to 18.6% by 1996. Over the entire sample

period, the average proportion is 13.9%. Based on a yearly comparison, client

firms of commercial banks are not significantly smaller in size compared to those

of investment banks. However, over the entire sample period, the average

commercial bank client firm is significantly smaller by about $4 bn, at a 10%

level. On the other hand, both mean and median issue amounts underwritten by

---

[21] There are 33 observations with negative values of interest expense relative to operating income due to negative operating income; for these observations we have used zero to replace the negative value.

[22] The frequency of commercial bank underwritten issues in 1996 is much lower than the number of transactions reported in (Bhargava and Fraser, 1998), mainly due to the fact that we only use industrial bond issues, and the heavy data requirement in our study reduces the sample size to some extent.

comm

on a

D

BPS)

lower

BPS s

comme

the diff

but the

yields

underw

underw

the diffe

investm

charact

controll

Ma

explore

Comme

only 7.7

comme

both ma

23 We us

commercial banks are significantly smaller than those by investment banks even on a yearly basis, except the first year.

During the whole sample period, the mean net yield (basis point spread or BPS) of commercial bank underwritten issues is 120.08, which is significantly lower than the 137.7 of investment bank underwritten issues. The medians of BPS show the same results as the means. The median of BPS is 71 for commercial bank clients and 91 for investment bank clients. A similar pattern of the difference in BPS is reported using pre-Glass-Steagall era data (Puri, 1996), but the univariate results are not enough to draw any conclusions. The lower net yields of commercial bank underwritten bonds could be the result of superior underwriting abilities, but it is also possible that commercial banks may choose to underwrite for safer firms or firms with characteristics that reduce the BPS. Thus, the difference in BPS between commercial bank underwritten issues and investment bank underwritten issues is not comparable, unless the firm characteristics and the potential endogenous selection problem are formally controlled for.

Markets segmented by size of issue[23] are also compared in Table 1.3 to explore the possible regulatory distortion in the clientele of commercial banks. Commercial banks underwrite 20.8% of the issues in the small issue market, and only 7.7% of the issues in the large market. The size of issue underwritten by commercial banks is also significantly smaller than that by investment banks in both markets, whereas, the size of commercial bank clients in the small issue

---

[23] We use the median size of issue (150 million dollars) of the full sample to separate the

26

market has no difference in mean and in median. In the large issue market, both mean and median of firm size are significantly smaller for commercial bank customers. Net yields (BPS), for commercial bank underwritten issues are significantly lower although the credit ratings are not significantly better in the small issue market. In the large issue market, the credit ratings of commercial bank clients are significantly lower, but the net yield is not significantly higher. The higher association of lower quality firms may imply that commercial banks are less able to retain higher rated firms in the large issue market.

The credit ratings in Table 1.4 are categorized into 7 groups to examine possible specialization in underwritings on this dimension. The results are consistent with the theory proposed in Diamond (1991) that borrowers with credit ratings toward the middle of the range have a higher demand for bank monitoring. The effect of monitoring is also more valuable for the middle rated firms. Commercial banks do not underwrite any issues for the highest and the lowest rating groups. The proportion of the sample underwritten by commercial banks is the highest for the A and Baa groups. The distributions of issuer credit ratings are significantly different at the 10% level. Basis point spreads are also significantly lower for the A and Baa groups that are underwritten by the commercial banks than that by investment banks, while there is no difference for the Aa, Ba and B groups. Interestingly, category B shows higher basis point spreads for commercial bank underwritten issues, although it is not statistically significant. If the perceived conflict of interest increases or the value of bank

---

markets.

27

monu

inves

or eve

enoug

ratings

conflic

questi

monitoring diminishes as credit rating decreases when the issuer is in the non-investment grade category, then commercial bank association creates less value or even negative value for such a firm. When the negative impact is large enough, commercial banks will not underwrite for firms with extremely low credit ratings such as C or below. Therefore, these results are consistent with both the conflict of interest hypothesis and the low value of bank monitoring for questionable or inferior quality issues.

1.5

T

on the

impos

compe

bank i

conflic

The firs

underw

comme

ability o

investig

price (n

The

beta coe

and 1.7 f

The inde

rating, c

[24] In order
these sub
market su
the net yie
adjustmen

1.5 Regulatory Distortion and Comparative Advantages of Underwriters

The study of the determinants of underwriter selection in this paper is based on the certification ability of underwriters and the distortion of revenue limitation imposed only on commercial banks. In terms of certification ability, we test four competing but not mutually exclusive hypotheses. As stated above, they are the bank information advantage hypothesis, the bank relationship hypothesis, the conflicts of interest hypothesis and the bank information monopoly hypothesis. The first two represent the relative advantages of commercial banks as underwriters, while the last two represent the relative disadvantages of commercial banks as underwriters. Due to the 10 percent revenue limitation, the ability of commercial banks in handling large issue could be hampered. We then investigate the possible distortion by examining the relationship between bond price (net yield) and issue size as well as firm size.

The results of the probit model estimation of underwriter selection and the beta coefficients of second stage BPS regressions are reported in Tables 1.5,1.6 and1.7 for the full sample, and the small and large issue markets respectively[24]. The independent variables in all the analyses are the same except for credit rating, cash, reduction of long-term debt, the interaction between dummy

---

[24] In order to prevent unnecessary collinearity in estimating the BPS regressions for these subsamples, the explanatory variable, size of issue is dropped in the small issue market subsample, since the results in Appendix B2 show this variable does not explain the net yield of bonds in the small issue market. For the same reason, the endogenous adjustment terms are dropped in the large issue market.

variab

exper

As

choice

spectr

estima

capture

regress

rating t

of long-

empiric

The

refinanc

operatin

regressi

between

and inter

regressi

term. The

stage pro

[25] The hig
income is
[26] The assi
is Aaa or A
[27] See Sec

variables representing the intention to refinance bank debt and high interest expense[25] and the endogenous selection adjustment terms.

As in Diamond (1991), the relationship between firm credit rating and the choice of underwriter is not linear. Firms with credit ratings in the middle of the spectrum tend to be associated with commercial banks. So, in the probit estimation, we use credit rating[26] and non-investment grade dummy variable to capture this nonlinear relationship. However, in the second stage BPS regressions, we only use non-investment grade dummy to control the credit rating to avoid too much collinearity in the linear regression. Cash and reduction of long-term debt are the instrumental variables we used to enhance the empirical estimation[27].

The interaction between the dummy variable representing the intention to refinance bank debt and the indicator of high interest expense relative to operating income cannot capture the effects in the second stage BPS regressions too well. So we use a more continuous measure, the interaction between the dummy variable representing the intention to refinance bank debt and interest expense relative to operating income, in the second stage BPS regressions and report only the results of model specified with this interaction term. The endogenous selection adjustment terms are estimated from the first stage probit, and the variables are described in Appendix A. The second stage

---

[25] The high interest expense indicator is one if the interest expense relative to operating income is greater than the median of this variable, 0 otherwise.
[26] The assigned value of credit rating is 1, if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade.
[27] See Section 1.3 for a detailed discussion.

BPS

remov

uncha

1.5.1

It n

distribu

this pra

this cru

observ

smaller

banks

be obs

banks

strateg

the 10

section

regulat

If c

then ce

Further

betwee

BPS regressions are also analyzed by alternative model specifications, which remove some insignificant independent variables with the results essentially unchanged. We report these additional results in Appendices B1 and B2.

1.5.1   Regulatory Distortion of Commercial Bank Underwritings

It may be plausible to assume commercial banks have disadvantage in distributing the corporate securities they underwrite, since they were barred from this practice for 60 years. As an entrant to the market, they need to redevelop this crucial skill in order to distribute large issues effectively. However, we observe that the issue size managed by commercial banks became smaller and smaller over time during 1993 to 1995. This trend seems puzzling. If commercial banks gain experience through completing deals, then the opposite trend should be observed. One possible explanation of this trend would be that commercial banks possess unique advantages in underwriting for small clients, so they strategically position themselves in the small issue market. On the other hand, the 10 percent revenue limitation may be the cause of this phenomenon. In this section, we empirically explore whether the small client advantage or the regulatory distortion is the underlying reason for the above trend.

If commercial banks possess distribution abilities similar to investment banks, then ceteris paribus, there will be no observed selection based on issue size. Furthermore, the effect of issue size on the bond prices should be the same between these two types of underwriters. However, the results in Tables 1.5, 1.6

31

and1

signifi

size i

assoc

shows

bank

all oth

of the

Th

under

condit

issue.

ability

bank cu

Cor

comme

In their

investig

of bond

the com

underwr

firm size

also con

and1.7 do not support this null hypothesis. In fact commercial banks show a significant disadvantage in handling large issues. The probit estimates on issue size in Tables 1.5 and1.6 indicate that commercial banks are significantly associated more with small issue than with larger issues. Besides, Table 1.7 shows that the beta coefficient of issue size for BPS regressions of commercial bank clients is highly significant and positive in the large issue market. However, all other estimates on issue size are close to zero for BPS regressions regardless of the identity of underwriter.

The results demonstrate that a commercial bank has to sell the bond it underwrites at a lower price, as the issue size increases. Under current market conditions, commercial banks lose on the ground in dealing with large bond issue. Consequently, the clients of commercial banks suffer from the limited ability of their underwriters. This may cause under-investment of commercial bank customers.

Contrary to the finding by Gande et al (1997), we do not find evidence that commercial banks facilitate smaller firms in gaining access to the capital market. In their paper, they derive the conclusion by examining the issue size instead of investigating the firm size directly. In fact, commercial banks can reduce net yield of bonds more than investment banks when the size of firm is larger. Based on the comparative advantage of commercial banks on firm size, they should underwrite more large firms than small firms. However, the probit estimates on firm size in Tables 1.5, 1.6 and1.7 fails to show this pattern. When issue size is also considered, we find that the inconsistency in firm size is due to commercial

32

bank

hanc

corre

syste

hypot

E

under

quant

invest

some

the b

of bo

yield

unde

unde

its cli

T

repo

resul

Appe

acros

comm

an es

banks being constrained to handle only small issues (because of their inability in handling large issue sizes). Since firm size and issue size are positively correlated, when one variable is restricted the other may be affected systematically. Thus, these results do not support the small clients advantage hypothesis.

Besides the advantage of studying the pros and cons of different underwriters, the application of the switching regression model allows us to quantify the benefits that different underwriters create. Therefore, we are able to investigate the effect of bank entry and regulation distortion at the micro-level, something which has not been done by previous research in this area. We define the benefits created by the chosen underwriters by the expected mean net yield of bond issue, had it chosen the unselected underwriter minus the observed net yield of bond issue. Thus this term will be positive if the net yield of bond issue underwritten by selected underwriter is smaller than that by unselected underwriters. It also means that the selected underwriter perform better to serve its clients than the counter group.

The benefits presented in Table1.8 are estimated by using the results reported in Table 1.5. To check the robustness of the results, we also use the results reported in Appendix B1 to estimate the benefits and present them in Appendix B3. The benefits created by the selected underwriters are analyzed across time, size of issue and credit ratings. The full sample results show that commercial bank entry created insignificant benefits for clients on average, with an estimate of 2.43 during the whole sample period. Only firms with credit ratings

in the middle range as a group show significantly positive benefits in Panel B of Table 1.8.

The inefficiency of commercial bank underwritings could be driven by two factors. First, commercial banks were barred from underwriting for nearly 60 years. As new entrants to the security underwriting business, they need time to develop their underwriting expertise. Second, commercial banks were allowed to underwrite corporate securities again under regulatory restrictions. Therefore, we have a group of constrained underwriters competing with the unconstrained group. Thus, the benefits created by investment banks are significantly positive since they are "ahead" of commercial banks by 60 years and they are competing without constraints.

In order to confirm the inefficiency that may be caused by the revenue limitation, we continue the analysis by splitting the sample into small issue market and large issue market and into two subperiods, years 1991 to 1993 and 1994 to 1996. We re-estimate the benefits for these four subgroups to accommodate the changes in different issue sizes and different entry stages of commercial banks. The results reported in Table1.9 indicate that bank-entry in the security underwriting business is beneficial to the commercial bank clients as a group.

When we compare the magnitude of benefits created by the selected underwriters across different issue size markets, we find the magnitude is smaller in the large issue market than in the small issue market. This is consistent with the results in Tables 1.6 and1.7 that, overall, the selection of underwriters is less

pron

efficie

sub-c

signif

where

marke

signifi

rating

among

the fin

securi

higher

the ine

Al

comme

market

clients

estima

comme

investr

If th

observe

move tc

pronounced in the large issue market. However, the patterns of underwriting efficiency of commercial banks are different between markets. During the later sub-period (during 1994 to 1996), commercial bank underwritings demonstrate a significantly positive estimated benefit of 24.39 in the small issue market, whereas the opposite is observed in the large issue market. In the large issue market, all estimated benefits of commercial bank underwritings change from significantly positive to negative numbers except the issuers with middle credit ratings (A or Baa). However, we can only establish significant negative benefits among the best-rated (Aaa and Aa) small issuers. The results are consistent with the findings of Nanda and Warther (1998) that smaller firms, and those that issue securities less often and have lower credit ratings tend to be more loyal and pay higher fees. These are the "locked-in" clients. However, for these trapped clients, the inefficiency occurs at the later entry stage of commercial banks.

Although bank entry is not beneficial to all issuers, we do observe that commercial banks improve their underwriting ability over time in the small issue market. The reduction in magnitude of estimated benefits for investment bank clients at a later period is consistent with the above notion. The smaller positive estimated benefits imply that the differences in underwriting abilities between commercial banks and investment banks become smaller from the viewpoint of investment bank clients.

If there was no distortion in the economy, as time goes by, we should observe a similar phenomenon in the large issue market, and the market should move towards a better equilibrium with more firms teaming up with the "right"

underwriters and commercial banks improving their underwriting ability. Although we observe the above "moving towards equilibrium" phenomenon that the firms served by investment banks at later period are the ones can receive positive benefits, we cannot conclude that commercial banks improve their underwriting ability. The timing of observed inefficiency is consistent with the hypothesis of regulation constraints rather than that of lack of distribution network or expertise because commercial banks are entrants. In addition, the large coefficient of issue size estimated in the BPS regression for commercial bank clients in Table 1.7 points out the weakness of commercial bank underwritings in large issue market.

Besides the above evidence on supporting the regulatory distortion, we consider two other minor modifications of the revenue limitation regulations in 1993 and in 1996. In 1993, the Federal Reserve Board allowed section 20 subsidiaries to use an alternative revenue test that was indexed to account for changes in interest rates since 1989. The shift in interest rates causes the eligible revenues of commercial banks to shrink, therefore, the base of eligible income used to calculate the revenue limitation is smaller even though the level of eligible and ineligible activities of commercial banks remains the same. Although the new indexed test is expensive and complicated to execute, five section 20 subsidiaries switched to the new measure[28]. This implied that these section 20 subsidiaries were operating close to the 10% revenue limit around that

---

[28] See Order of Federal Reserve System, Docket no. R-0841, "Revenue Limit on Bank-Ineligible Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and Dealing in Securities."

perio

1993

I

again

the in

the qu

rangir

comm

Steag

comm

dollar

that co

market

have d

In

was a

operati

will be

disadva

29 See F
Ineligibi
and Dea
30 See F
Change
Section

period. This may explain why the issue amounts are relatively smaller in years 1993 and 1994.

In 1996 the Federal Reserve Board amended the revenue limitation order again. The new order allows commercial banks to exclude the interest earned on the ineligible securities from the 10% revenue limit. The change would decrease the quarterly ineligible revenue of some section 20 subsidiaries by a magnitude ranging between 19% and 79%[29]. Not surprisingly, the issue amounts of commercial bank clients increased sharply in 1996. Compared to the pre-Glass-Steagall era, the market share of commercial banks is still small. In 1996, commercial banks underwrote roughly 14% of the bond market based on the dollar amount in our sample, while in 1929, Kroszner and Rajan (1997) report that commercial banks underwrote 45.4% of the market. The relatively smaller market share nowadays, is most likely the result of regulation constraints as we have demonstrated.

In 1997, the Federal Reserve Board rescinded the original firewall, which was a set of 28 rules, and consolidated the remaining restrictions in a series of 8 operating standards[30]. At the end of 1996, the revenue limit was raised to 25%. It will be interesting to examine the effects of these regulation changes to see if the disadvantage of commercial banks in handling large issue under 10% revenue

---

[29] See Federal Register, September 17, 1996, "10 Percent Revenue Limit on Bank-Ineligible Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and Dealing in Securities," volume 61(181): 48953-48954.
[30] See Federal Reserve System Docket No. R-0958, "Bank Holding Companies and Change in Bank Control (Regulation Y); Amendments to Restrictions in the Board's Section 20 Orders." 12 CFR PART 225.

limitation disappears and if the large issue market will move to a more efficient matching between underwriters and client firms.

1.5.2. Advantages of Commercial Banks as Underwriters

The probit estimates of credit rating and non-investment grade in Tables1.5 and1.6 are consistent with the informational advantage hypothesis. Firms with lower credit ratings tend to select commercial banks as their underwriters. In Table1.5, the variables related to the information asymmetry problem are daily equity return volatility, equity trading volume, firm size, and Tobin's q. The results for both daily equity return volatility and firm size are weak in supporting any hypothesis regarding certification ability of underwriters; we do not discuss these two variables further in this section. The association of commercial banks with clients that have low equity trading volume supports the information advantage of commercial bank hypothesis.

The last variable used as a proxy for the information problem is Tobin's q, which is also used as a proxy for investment opportunity in existing empirical finance literature. Both probit and BPS estimations show support for the information advantage and the bank relationship hypotheses rather than for the information monopoly hypothesis. The positive relation of Tobin's q with commercial banks and the lower beta coefficient of BPS regression relative to the estimate of investment bank underwritten issues imply that commercial banks possess an advantage in solving the information problem and in serving the

financing needs of growing firms. Therefore, commercial banks may certify firms with higher Tobin's q better than investment banks. Similar results are found in Houston and James (1996), indicating that among firms with public debt outstanding, the reliance on bank debt is positively related to the importance of growth opportunities, with bank information monopolies having less importance for these firms. They also find that the reliance on bank borrowing is decreasing in overall leverage, a result that we too obtain. Overall, the significant association of commercial banks with firms that are less risky, traded less frequently, lower rated, and having higher Tobin's q supports the informational advantage and the bank relationship hypotheses.

Besides the exogenous selection when firm public information interacts with the identity of its underwriter, the signs and magnitude of endogenous selection adjustment terms can reveal the unobservable nature of underwriter selection. In Table1.5, the estimated signs of adjustment terms are both negative, which supports the cherry-picking behavior of commercial banks. However, only the estimates for commercial banks in the full sample or in the small market are significant. This result implies that commercial banks do possess better unobservable ability that is valued by the market, which puts investment banks at a disadvantage in certifying the private information of their customers. Overall, there is no evidence of endogenous selection in the large issue market, whereas, commercial banks can cherry-pick firms in the small issue market.

1.5.3 Disadvantages of Commercial Banks as Underwriters

One important concern regarding commercial banks engaging in security underwriting is the potential conflicts of interest. The variables used to investigate this issue are whether the proceeds are used to repay bank debt, leverage, interest expense relative to operating income, and its interaction with intention to refinance bank debt. As discussed in Kroszner and Rajan (1997), if investors are aware of the motives of an underwriter, in equilibrium the underwriter will be forced to issue securities that are less risky and questionable to avoid the price discount.

The probit estimates of the dummy variable for intention to refinance bank debt and leverage are consistent with the above notion, indicating that commercial bank clients are less risky and refinance for bank debt less frequently. However, we do not find the support for this argument by the probit estimates on interest expense relative to operating income and the interaction between intention to refinance bank debt and high interest expense indicator. In the BPS equations, interest expense relative to operating income and its interaction with intention to refinance bank debt show large price discounts, especially for commercial bank clients. The effect is stronger in the small issue market but weaker in the large issue market.

In Table1.5, the estimates of interest expense relative to operating income and its interaction with intention to refinance bank debt from the BPS regression for commercial bank underwritten issues are nearly triple compared to the same

numbers for investment banks. However, the BPS is lower when the purpose of issue is refinancing bank debt and the level of interest expense is low. Overall, we do not find investors use the intention to refinance bank debt as a proxy for potential conflicts of interest and impose a price discount when the underwriter is also a commercial bank. Instead, the effects of conflicts of interest are demonstrated through interest expense relative to operating income and its interaction with refinance bank debt. Thus, we need to consider the beta coefficients of these three variables as a group when interpreting the effects of conflicts of interest.

The variables used to test bank relationship and information monopoly hypotheses are volatility of daily equity return, Tobin's q, sales growth, and profitability. Tobin's q has been discussed previously with results that do not support the information monopoly hypothesis. The estimates of volatility of daily equity return, sales growth and profitability support the information monopoly hypothesis. Although the probit estimates are not significant in Tables1.5 and1.6, the estimates of BPS regressions indicate that commercial banks are at a disadvantage when underwriting for firms with high volatility of daily equity return, sales growth and profitability.

For commercial bank clients, higher growth rates will increase BPS of bonds significantly with an estimate of 0.82 in Table1.5; conversely, for investment bank clients, the estimate is –0.06 (insignificantly different from zero). Increasing the daily equity return volatility increases the BPS of bond issues for the clients of both underwriters, however, the magnitude is tripled for commercial bank clients.

41

Theoretically, while high profit is a favorable characteristic of firms, we should

observe profitability reducing the BPS of bonds. This is true for investment bank

customers, but the estimate is close to zero and positive for the commercial bank

clients. Although a bank relationship is less valuable for firms with high profits, it

should not lead to a zero beta coefficient of BPS regression. The possible

explanation is the benefit of high profit is cancelled out due to the bank's

monopoly power to share the profit with its client in the future. The effects are

magnified in the small issue market but reduced in the large issue market. These

results provide support of a hold-up problem of commercial banks. Due to the

hold-up problem, commercial banks are less credible in underwriting for firms

with high volatility of equity return, "past" growth[31] and profitability.

1.5.4 The Performance Comparison between Commercial Banks and Investment Banks

In general, investment bank clients as a group are better off staying with

their own underwriters, while those switching to commercial banks are not

necessarily better off. When the results in Tables 1.8 and 1.9 are compared

across credit ratings, firms in the middle range of credit ratings that switch to

---

[31] The results of Tobin's q and sales growth are different, although we try to use them as the proxies for growth opportunities. However, Tobin's q represents future growth, sales growth is realized past growth. The former requires better information technology to certify the message it tries to convey, the latter, however, may not be a good proxy for future growth, instead, the past growth seems to provide information similar to profitability but it is not a complete repetition, because after operating income is included, sales growth still possesses explanatory power in the BPS regression.

commercial banks are always better off, regardless of whether they are small issuers, large issuers, at the early stage or later stage of bank-entry. The results are consistent with the theory of Diamond (1991) that middle rated firms receive the most benefits from bank association. For firms with other credit ratings, the benefits are either insignificantly different from zero or significantly negative. The groups that suffer from the bank entry are high rated small issuers and low rated large issuers[32].

Another interesting observation in Table1.9 is that if we compare the results across subperiods, the estimated benefits for investment bank clients are all positive at later period, but not for commercial bank clients. The results are consistent with the explanation that as more firms that should be underwritten by commercial banks switched from investment banks, the firms remaining with investment banks were the ones receiving greater benefits of using the underwriting service of investment banks.

However, the factors affecting the benefits created by commercial banks are much more complicated. At the early entry stage, commercial banks may have picked the firms from the top of the list, but at the same time, since they just started developing their underwriting ability, the two effects may cancel each other out. Similar effects may exist at the later entry stage, however the process is reversed, because banks pick firms with lower benefit potential while their underwriting ability improves. The 10 percent revenue limitation creates additional complications. Thus, at the later entry stage, the performance of

---

[32] The result is marginal significant if one-tailed t-test is used.

commercial banks worsens in the large issue market. Although one may argue

that the large issue clients could switch to investment banks, the switching cost

may not be worth the benefit, especially for the clients with low credit ratings. We

may then observe some inefficiency in the commercial bank underwritings.

1.6   Conclusion

We find that commercial banks do not actively engage in the small issue market voluntarily. In fact, based on their comparative advantage along the firm size dimension, they should be more active in underwriting for large firms. However, the 10% revenue limitation restricts their ability in handling large issues. We provide evidence that this distorted behavior of commercial banks observed in the security market during the sample period is the result of a regulatory restriction. This contributes to the observed inefficiency in the large issue market among the commercial bank clients at the later entry stage.

In this paper, we examine the determinants of underwriter selection, and establish the comparative advantages of commercial banks and investment banks. Commercial banks are superior in terms of information advantage and provide a better financing opportunity, thus they are associated with firms that have higher Tobin's q, lower leverage, are traded less frequently and lower rated. The endogenous selection adjustment term also indicates that commercial banks can cherry-pick better customers. Due to concerns of conflict of interest, commercial banks clients incur larger price discounts if they have higher interest expense relative to operating income and when the purpose of issue is to repay bank debt. In addition, when firms with volatility of equity return, high past growth and profitability are associated with commercial banks, the potential bank monopoly power results in lower bond prices for these clients.

By using an empirical model that is consistent with theoretical work in this area, we are able to better quantify the benefits created by the selected underwriters for their client firms. The positive benefits created by investment banks demonstrate that they are valuable underwriters in the economy. The comparative advantages and specialization in security underwritings may also explain why investment banks coexisted with commercial banks in the pre-Glass-Steagall era, when both types of underwriters could compete freely. Therefore, this puzzle unexplained by previous studies is, we believe, resolved.

Although the re-entry of commercial bank in the security underwriting business is not beneficial to all firms under the current regulatory and market environment, firms with middle credit ratings are better off on average. The distinct abilities of commercial banks and investment banks imply their coexistence is valuable to the economy, so clients at different segments have more choices and may be better served by different types of underwriters.

APPENDIX 1

TABLES OF ESSAY 1

Table 1.1
Summary of theoretical predictions regarding choice of commercial bank
(vs. investment bank)

Hypothesis	Prediction of probability(bank) is:	Empirical proxy	Predicted sign on empirical proxy
Information Advantage	Positively related to information asymmetry	Equity trading volume	-
		Volatility of stock return	+
		Growth Opportunity (Tobin's q) (Sales growth)	+
		Firm size (Market value of equity)	-
	Positively related to the value of bank monitoring	Credit ratings (BEST) (MID) (LOW)	- + -
	Positively related to cost of collecting information	Firm size	-
	Negatively related to borrower's risk	Risk (Volatility of stock return) (Total debt/total assets) (Interest expense relative to operating income)	-
	Positively related to borrower's (unobserved) quality[a]		

[a] Since the quality is unobserved, we do not have a proxy for this variable. However, the private information can be inferred by the underwriting decision of both underwriters. See Section 1.3 for a detailed discussion.

Table 1.1 (Cont'd)

Hypothesis	Prediction of probability(bank) is:	Empirical proxy	Predicted sign on empirical proxy
Conflicts of Interest	Negatively related when bank loan is to be repaid	Use of proceeds includes repayment of bank loan	-
	Negative related to borrower's risk	Risk (Volatility of stock return) (Total debt/total assets) (Interest expense relative to operating income)	-
	Negatively related to information asymmetry	See the proxies in the information asymmetry section of information advantage hypothesis	The signs are opposite to those in the Information Advantage Hypothesis.
Bank Relationship	Positively related to need for future bank financing	Cash and cash equivalent Growth and investment Opportunity (Tobin's q) (Sales growth) Profitability (Operating income)	- + -
Information Monopoly	Negatively related to information asymmetry	See the proxies in the information asymmetry section of information advantage hypothesis	The signs are opposite to those in the Information Advantage Hypothesis
	Negatively related to potential hold-up problem	Growth and investment opportunity (Tobin's q) (Sales growth)	-
	Negatively related to profitable firm	Profitability (Operating income)	-
	Positively related to firm required to keep compensating balances	Cash and cash equivalent	+

49

Table 1.2

Descriptive statistics of bond issue and firm characteristics by year and by underwriter-type

Total numbers, percentages, sizes and basis point spreads of bond issues are reported by year and by underwriter-type. The size of firms is the market value of equity in billions dollars. The basis points spread 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. 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.

Year	1991	1992	1993	1994	1995	1996	1991-1996
Number of Issues underwritten by:							
Commercial banks	9	25	32	20	54	44	184
Investment banks	205	223	236	115	172	192	1143
Percentage of Issues underwritten by:							
Commercial banks	4.21	10.08	11.94	14.81	23.89	18.64	13.87
Investment banks	95.79	89.92	88.06	85.19	76.11	81.36	86.13
Mean Issue Size by underwriter ($ million)							
Commercial banks	144.44	91.4***	92***	67.5***	59.17***	136.38*	92.8***
Investment banks	175.92	203.47	190.07	158.17	178.24	188.61	184.91
Median Issue Size by underwriter ($ million)							
Commercial banks	100	100***	100***	10***	25***	125*	100***
Investment banks	160	159.5	150	125	150	150	150

50

Table 1.2 (Cont'd)

Year	1991	1992	1993	1994	1995	1996	1991-1996
Mean Issuer Firm Size by underwriter ($ billion):							
Commercial banks	8.97	10.18	5.21*	5.58	6.19	4.35***	6.22*
Investment banks	12.66	10.06	10.12	10.54	9.46	11.51	10.74
Median Issuer Firm Size by underwriter ($ billion):							
Commercial banks	2.75	9.44*	3.62	4.55	2.76	2.04***	3.62***
Investment banks	5.55	2.86	4.74	3.23	3.72	6.76	4.51
Mean Basis Point Spread for Issues underwritten by							
Commercial banks	92.2	141.96	115.67	113.39	123.93	114.86	120.08*
Investment banks	120.72	159.92	155.91	152.87	125.12	109.81	137.7
Median Basis Point Spread for Issues Underwritten by							
Commercial banks	88	68*	76*	61	75*	68	71***
Investment banks	104	104	100	78	83	70	91

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

Table 1.3
Descriptive statistics of bond issue by issue size market and by underwriter-type

This table reports means and medians of issue size of bond, firm size (market value of equity), credit ratings, basis point spread of bond over the ex ante yield of U.S. Treasury security of comparable maturity, as well as the number of issue and percentage of issue by underwriter-type when the market is segmented into different sizes of issue. Credit ratings is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. When mean and median of a variable are reported, the difference in means between two types of underwriters are tested by t-test and that in medians by Wilcoxon rank-sum test, respectively. The small issue market is defined as the new-issue bond market if the size of issue is less than the median of the issue size (150 million dollars). The large issue market is defined as the new-issue bond market if the size of issue is greater than or equal to 150 million dollars.

	Small Issue Market		Large Issue Market	
	Mean	Median	Mean	Median
Issue Size by Underwriter ($ million)				
Commercial banks	45.26***	16.5***	207.24***	195***
Investment banks	79.02	100	265.8	229.15
Issuer Firm Size by Underwriter ($ billion)				
Commercial banks	5.75	2.99	7.35***	3.86***
Investment banks	6.48	2.51	13.99	6.79
Credit Ratings of Issue by Underwriter:				
Commercial banks	2.08	2	2.17**	2**
Investment banks	2.08	2	2.0	2
Issue Basis Point Spread by Underwriter:				
Commercial banks	111.75***	71***	140.12	72
Investment banks	149.36	98	128.79	85
Number of Issues Underwritten by:				
Commercial banks	130		54	
Investment banks	495		648	
Percentage of Issues Underwritten by:				
Commercial banks	20.8		7.69	
Investment banks	79.2		92.31	

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

Table 1.4
Issuer credit ratings distribution and basis point spreads by underwriter-type

The basis points 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. The first column contains the proportion of the sample for each credit rating category, followed by the means and median of BPS for each credit rating category for the commercial bank underwritten issues. Columns 4, 5, and 6 contain the same information as that in columns 1, 2, and 3 for investment bank underwritten issues. Test for difference in means is a two-tailed t-test. Test for difference in medians is a Wilcoxon rank-sum test. The last row in the table shows the chi-square test and p-value, with the null hypothesis being that the credit ratings distributions for issues underwritten by both underwriters are the same.

Moody's Credit Ratings	Commercial Banks			Investment Banks		
	Percentage of Issue	Basis Point Spread		Percentage of Issue	Basis Point Spread	
		Mean	Median		Mean	Median
Aaa	0			1.84	50.67	44.1
Aa	7.61	52.99	53	13.3	55.52	50
A	47.83	57.37***	55***	40.42	80.12	76
Baa	26.09	89.26***	80***	25.81	128.44	110
Ba	9.78	234.89	233	9.71	269.78	245
B	8.7	486.97	463	8.31	427.74	396
C or below [a]	0			0.61	346.77	275

Chi2(6)= 10.74; p-value = .097

*, **, *** Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.
[a] This category includes non-rated bonds.

Table 1.5

Estimates of the determinants of underwriter selections and basis point spreads on bonds underwritten by the commercial banks or by investment banks.

The first two columns report the probit estimates and p-values of t-test of underwriter selection equation. In column 1, the dependent variable (CBL) is 1 if the lead underwriter is a commercial bank, and 0 if it is an investment bank. Columns 3 to 6 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. In columns 3 and 4, the sample includes only commercial bank underwritten issues. In columns 5 and 6, the sample includes only the investment bank underwritten issues. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. High interest indicator is a dummy variable, the assigned value is 1 if the level of interest expense relative to operating income is larger than the median of this variable. Refinance bank debt*Interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. The estimates for the yearly dummies and constant terms are not reported though they are included.

Table 1.5

Independent Variables	Probit		BPS(Commercial bank)		BPS(Investment bank)	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Total debt/total assets	-0.011	0.00	-0.39	0.28	0.70	0.00
Equity trading volume	-0.005	0.00	-0.29	0.15	0.28	0.00
Volatility of equity return (residuals)	-0.015	0.38	9.39	0.00	3.85	0.00
Maturity of issue	-0.008	0.20	0.90	0.11	1.04	0.00
Sales growth (5-yr.)	-0.002	0.47	0.82	0.00	-0.06	0.57
Tobin's q	0.182	0.02	8.14	0.44	12.99	0.00
Operating income/total assets	0.005	0.64	-0.11	0.92	-2.97	0.00
Log(market value of equity)	-0.059	0.21	-33.26	0.00	-23.55	0.00
Log(size of issue)	-0.379	0.00	-4.69	0.60	-0.27	0.94
Refinance bank debt (indicator variable)	-0.292	0.07	-59.31	0.00	-17.27	0.01
Interest expense/operating income	-0.047	0.84	59.45	0.06	19.52	0.07
Refinance bank debt * High interest indicator	0.212	0.31	*	*	*	*
Refinance bank debt * Interest expense	*	*	94.09	0.03	28.77	0.03
Credit rating	0.582	0.00	*	*	*	*
Non-investment grade	-0.426	0.07	150.67	0.00	154.92	0.00
Endogenous adjustment term	*	*	-83.72	0.03	-3.18	0.78
Cash/(total assets-cash)	-0.002	0.49	*	*	*	*
Reduction in long-term debt	0.008	0.01	*	*	*	*
Pseudo-R²	0.19					
Adjusted R²			0.82		0.73	
No. of observations	1327		184		1143	

Table 1.6

Small issue market: Estimates of the determinants of underwriter selections and basis point spreads on bonds underwritten by the commercial banks or by investment banks.

The small issue market is defined as the new-issue bond market if the size of issue is less than the median size of issue (150 million dollars). The first two columns report the probit estimates and p-values of t-test of underwriter selection equation. In column 1, the dependent variable (CBL) is 1 if the lead underwriter is a commercial bank, and 0 if it is an investment bank. Columns 3 to 6 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. In columns 3 and 4, the sample includes only commercial bank underwritten issues. In columns 5 and 6, the sample includes only the investment bank underwritten issues. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. High interest indicator is a dummy variable, the assigned value is 1 if the level of interest expense relative to operating income is larger than the median of this variable. Refinance bank debt*Interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. The estimates for the yearly dummies and constant terms are not reported though they are included.

Table 1.6

Independent Variables	Probit		BPS(Commercial bank)		BPS(Investment bank)	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Total debt/total assets	-0.017	0.00	-0.16	0.71	0.71	0.00
Equity trading volume	-0.004	0.04	-0.18	0.29	0.17	0.06
Volatility of daily return (residuals)	-0.025	0.27	13.16	0.00	4.48	0.00
Maturity of issue	0.000	0.99	1.13	0.03	1.64	0.00
Sales growth (5-yr.)	-0.003	0.45	0.64	0.00	0.11	0.61
Tobin's q	0.349	0.00	-1.65	0.86	13.75	0.03
Operating income/total assets	-0.004	0.75	0.09	0.92	-4.88	0.00
Log(market value of equity)	-0.053	0.42	-21.74	0.00	-23.40	0.00
Log(size of issue)	-0.490	0.00	*	*	*	*
Refinance bank debt (indicator variable)	-0.287	0.21	-29.90	0.12	-24.28	0.02
Interest expense/operating income	0.157	0.60	108.32	0.00	13.98	0.38
Refinance bank debt * High interest indicator	0.006	0.98	*	*	*	*
Refinance bank debt * Interest expense	*	*	66.52	0.12	25.19	0.26
Credit rating	0.714	0.00	*	*	*	*
Non-investment grade	-0.431	0.19	98.69	0.00	167.25	0.00
Endogenous adjustment term	-0.005	0.23	-42.95	0.00	2.44	0.79
Cash/(total assets-cash)	0.013	0.00	*	*	*	*
Reduction in long-term debt	*	*	*	*	*	*
Pseudo-R^2	0.23					
Adjusted R^2			0.88		0.73	
No. of observations	625		130		495	

Table 1.7

Large issue market: Estimates of the determinants of underwriter selections and basis point spreads on bonds underwritten by the commercial banks or by investment banks.

The large issue market is defined as the new-bond market if the size of issue is greater than or equal to the median size of issue (150 million dollars). The first two columns report the probit estimates and p-values of t-test of underwriter selection equation. In column 1, the dependent variable (CBL) is 1 if the lead underwriter is a commercial bank, and 0 if it is an investment bank. Columns 3 to 6 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. In columns 3 and 4, the sample includes only commercial bank underwritten issues. In columns 5 and 6, the sample includes only the investment bank underwritten issues. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. High interest indicator is a dummy variable, the assigned value is 1 if the level of interest expense relative to operating income is larger than the median of this variable. Refinance bank debt*Interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. The estimates for the yearly dummies and constant terms are not reported though they are included.

Table 1.7

Independent Variables	Probit		BPS(Commercial bank)		BPS(Investment bank)	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Total debt/total assets	-0.004	0.46	-0.55	0.50	0.70	0.00
Equity trading volume	-0.006	0.02	0.05	0.93	0.37	0.00
Volatility of equity return (residuals)	-0.009	0.76	-1.00	0.88	3.48	0.00
Maturity of issue	-0.016	0.08	1.94	0.18	0.77	0.00
Sales growth (5-yr.)	0.000	0.98	0.20	0.86	-0.13	0.30
Tobin's q	-0.007	0.95	22.14	0.45	9.25	0.01
Operating income/total assets	0.003	0.84	-1.41	0.68	-1.47	0.01
Log(market value of equity)	-0.140	0.09	-47.95	0.00	-24.30	0.00
Log(size of issue)	-0.226	0.14	103.23	0.00	0.52	0.91
Refinance bank debt (indicator variable)	-0.196	0.42	-67.00	0.12	-9.23	0.21
Interest expense/operating income	-0.266	0.47	-28.70	0.73	28.26	0.05
Refinance bank debt * High interest indicator	0.371	0.22	*	*	*	*
Refinance bank debt * Interest expense	*	*	155.04	0.16	29.34	0.06
Credit rating	0.013	0.96	*	*	*	*
Non-investment grade	-0.027	0.94	185.95	0.00	145.54	0.00
Endogenous adjustment term	0.005	0.47	*	*	*	*
Cash/(total assets-cash)	0.003	0.44	*	*	*	*
Reduction in long-term debt	0.002	0.68	*	*	*	*
Pseudo-R^2	0.11					
Adjusted R^2			0.77		0.73	
No. of observations	702		54		648	

59

Table 1.8
Gross benefit for firm using the service of chosen underwriter rather than that of unchosen underwriter.

The gross benefit is defined as the expected mean net yield (BPS) of bond issues, had they chosen the unselected underwriter minus the observed net yield of bond issues. The benefit estimated in column 1 (below the heading of Commercial Bank Clients) is the predicted BPS of commercial bank client by using the estimates of investment bank BPS regression reported in Table 1.5 minus the original BPS of commercial bank client. Hence, the benefit in column 3 is estimated in the same way. The p-value of t-test is reported, the tested null hypothesis is the gross benefit is equal to zero.

Panel A. Gross benefit of full sample and by subperiods.

	Commercial Bank Clients		Investment Bank Clients	
Years	Benefit	P-value	Benifit	P-value
1991-1996	2.43	0.63	164.62	0.00
No. of observations	184		1143	
1991-1993	-0.65	0.91	171.31	0.00
No. of observations	66		664	
1994-1996	4.15	0.56	155.35	0.00
No. of observations	118		479	

Panel B. Gross benefit by credit ratings

	Commercial Bank Clients		Investment Bank Clients	
Credit ratings	Benefit	P-value	Benefit	P-value
Aaa or Aa	-16.22	0.02	181.08	0.00
No. of observations	14		173	
A or Baa	11.98	0.00	156.88	0.00
No. of observations	136		757	
Ba or below	-28.08	0.26	178.79	0.00
No. of observations	34		213	

Panel C. Gross benefit by the issue size (in million dollars)

	Commercial Bank Clients		Investment Bank Clients	
Issue Size	Benefit	P-value	Benefit	P-value
>= 150	-3.7	0.74	170.79	0.00
No. of observations	54		648	
< 150	4.98	0.36	156.55	0.00
No. of observations	130		495	

Table 1.9

Gross benefit for firm using the service of chosen underwriter rather than that of unchosen underwriter for small issue market and large issue market by subperiods.

The gross benefit is defined as the expected mean net yield (BPS) of bond issues, had they chosen the unselected underwriter minus the observed net yield of bond issues. The benefit estimated in column 1 (below the heading of Commercial Bank Clients) is the predicted BPS of commercial bank client by using the estimates of investment bank BPS regression reported in Table 1.6, regression results for small issue market (less than 150 million dollars), minus the original BPS of commercial bank client. Hence, the benefits in columns 3 to 8 are estimated in the same way. The large issue market includes issues with size being greater than or equal to 150 million dollars. These BPS regressions are not reported. The p-value of t-test is reported, the tested null hypothesis is the gross benefit is equal to zero.

Panel A. Gross benefit by credit ratings during 1991 to 1993.

| Credit Ratings | Small Issue Market | | | | Large Issue Market | | | |
| | Commercial Bank Clients | | Investment Bank Clients | | Commercial Bank Clients | | Investment Bank Clients | |
	Benefit	P-value	Benefit	P-value	Benefit	P-value	Benefit	P-value
All ratings	-4.20	0.64	103.18	0.00	24.58	0.00	-24.56	0.00
No. of observations	45		263		21		401	
Aaa or Aa	-22.12	0.26	91.73	0.00	10.94	0.11	3.91	0.55
No. of observations	4		23		4		85	
A or Baa	6.95	0.29	104.83	0.00	18.22	0.01	-35.20	0.00
No. of observations	34		181		13		259	
Ba or below	-48.10	0.35	102.58	0.00	58.89	0.01	-18.68	0.39
No. of observations	7		59		4		57	

Table 1.9 (Cont'd)

Panel B. Gross benefit by credit ratings during 1994 to 1996.

Credit ratings	Small Issue Market				Large Issue Market			
	Commercial Bank Clients		Investment Bank Clients		Commercial Bank Clients		Investment Bank Clients	
	Benefit	P-value	Benefit	P-value	Benefit	P-value	Benefit	P-value
All ratings	24.39	0.00	77.57	0.00	-6.30	0.73	21.96	0.00
No. of observations	85		232		33		247	
Aaa or Aa	-31.81	0.04	67.60	0.00	-11.67	0.69	10.45	0.37
No. of observations	4		37		2		28	
A or Baa	26.00	0.00	80.91	0.00	24.33	0.00	12.32	0.01
No. of observations	69		153		20		164	
Ba or below	33.86	0.44	74.19	0.01	-61.04	0.25	56.57	0.01
No. of observations	12		42		11		55	

62

ESSAY 2. COMPETITION AND COALITION AMONG UNDERWRITERS: THE ENTRY STRATEGY OF COMMERCIAL BANKS IN THE POST-SECTION 20 ERA

2.1   Introduction

During the recent debate over whether or not to repeal the Glass-Steagall

Act, investment banks have been the major opponents of the repeal. Although

investment banks have competed fiercely with commercial banks in the

legislative arena, commercial bank entry into security underwritings has been

accommodated to some extent. Commercial banks have entered this market as

co-managers through participation in investment bank lead syndicates. This

particular underwriting form accounted for only 10 percent of corporate bond

issues in 1991, but soared to 38 percent by 1996. During the same period,

commercial bank-lead syndicates underwriting bond issues increased from 4.2

percent to 18.7 percent. It is puzzling as to why commercial banks have not

competed for the lead manager roles more aggressively, having cooperated with

investment banks twice as much as they have competed. Even more puzzling is

why investment banks have not more actively deterred entry by excluding

commercial banks from participating in syndicates.

Including issues co-managed with investment banks, commercial banks

have participated in 56.4 percent of the new bond issues in 1996. Although prior

research has examined the underwriting activities of commercial banks when

they have led underwriting syndicates[33], the role of commercial banks as junior co-managers has yet to be examined. In this paper, we investigate the economic rationales driving coalitions between commercial and investment banks. To the best of our knowledge, this is the first paper examining the economic functions and effects of commercial banks as co-managers in security underwritings.

Financial markets are often characterized as possessing an oligopolistic structure. Anand and Galetovic (1997) show that intermediation markets are natural oligopolies, with entry being accommodated as long as cooperation is feasible. In this type of market, it may be beneficial for firms of various abilities to collude in the market. For security underwritings, it is a common practice to form syndicates among underwriters[34]. We would like to examine whether the coalitions among commercial banks and investment banks are driven predominantly by the industry market structure or some potential benefits of cooperation amongst underwriters.

If coalitions are driven predominantly by the oligopolistic market structure, i.e. if commercial banks act as perfect substitutes for investment banks in the syndicates, we should not observe any systematic pattern of coalition formation. Thus, the new form of underwriting activities would not differ from the existing investment bank lead-syndicates that commercial banks do not participate in. Following this line of reasoning, the choice of entry mode of commercial banks,

---

[33] See Ang and Richardson (1994), Puri (1994), Puri (1996), Gande et al (1997), Song et al (1999) for empirical results in this area.
[34] As stated in Eccles and Crane (1988, p.92), "The most visible ties among investment banks are the syndicates formed to underwrite and distribute a security offering." They report that the top six investment banks lead-managed 6,327 domestic security issues (excluding tax-exempt issues) from 1984 to 1986, over sixty percent of these deals were

either lead- or co-managing the syndicates, should not depend on the comparative advantages of commercial banks in different segments of the market. The percentage of commercial bank lead-managed issues relative to that of co-managed issues should only depend on the overall market power of commercial banks.

However, Song (1999) find that commercial banks and investment banks represent two distinct types of underwriters. Commercial banks possess informational advantages over investment banks due to their loan monitoring and transactional activities with clients (Fama, 1985). Association with commercial banks also provides clients with better financing opportunities in the future (See, for example, Holland, 1994; James 1987). However, these benefits do come with costs. The dual role of commercial banks as both lenders and underwriters creates the potential for conflicts of interest. For instance, a commercial bank may misrepresent information about its clients by overstating clients' prospects. They could then underwrite these "bad" loans, using the proceeds to repay bank debt (See Kroszner and Rajan, 1997; Gande et al, 1997). Additionally, the same informational advantages may give commercial banks a temporary information monopoly over the clients' private information, allowing banks to appropriate firms' future profits (Rajan, 1992; Sharpe, 1990; Greenbaum et al, 1989).

In addition to the above differences between commercial and investment banks, Song (1999) find that the ability of commercial banks in distributing large issues is hindered by a revenue limitation[35] imposed only upon them. This

co-managed by another top-six investment banks.
[35] The revenue limitation was set at 5 percent in 1987, was increased to 10% in 1989,

regulatory restriction constrains the amount of corporate issues commercial

banks can underwrite by limiting the revenues generated from certain in-eligible

security activities to 10 percent of the total revenues of section-20 subsidiaries[36].

Combining these two types of underwriters with complementary abilities

could create better underwriting services. A similar positive effect is identified by

Mohanram and Nanda (1998) in their joint ventures study. They find that the

stock market reacts positively to joint ventures that involve pooling of

complementary resources. In this paper, we address the question of whether

coalitions between commercial and investment banks are motivated by economic

incentives. We do so by testing the hypothesis that coalition arrangements of

commercial and investment banks mitigate disadvantages of both types, yielding

higher bond prices for their clients. In other words, we argue that the cooperation

is motivated by mutual benefits. When an investment bank is the lead underwriter

and a commercial bank participates as a co-manager, we define this new

structure as a *Hybrid syndicate*. The syndicates led by commercial banks are

defined as *CB-Lead syndicates*[37]. Those coalitions that do not include any

commercial banks are referred to as *PureIB syndicates*.

---

and was raised again to 25 percent in 1996. See Federal Reserve System, Docket No. R-0841, "Revenue Limit on Bank-Ineligible Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and Dealing in Securities."

[36] See J.P Morgan & Co. Inc., The Chase Manhattan Corp., Bankers Trust New York Corp., Citicorp, and Security Pacific Corp., 75 Federal Reserve Bulletin 192 (1989) (hereafter "1989 Order") for discussions on the regulatory environment that commercial banks are allowed to underwrite corporate securities. The section 20 subsidiary is the organizational form in which commercial banks are permitted to conduct the ineligible security activities. Ineligible activities refer to those not permitted before the relaxation of Glass-Steagall Act in 1989.

[37] 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, the sample size representing only 2.2% of the bond

When testing the above hypothesis, we also focus on the role that lead managers play in alleviating the moral hazard problem, i.e. the potential conflicts of interest inherent in commercial bank security underwritings. The literature provides both theoretical and empirical support for this problem. Pichler and Wilhelm (1998) provide a monitoring role for the lead underwriter to improve incentives and mitigate the moral hazard problem of syndicate participants. 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. In the context of this paper, investment banks are not subject to the aforementioned conflict of interest problem faced by commercial banks. They should be more credible in certifying security issues when the purpose of an issue is to repay bank debt and when the level of interest expense is relatively high. Thus, we test whether the reputational concerns of an investment bank will alleviate concerns by the market for conflicts of interest. We propose and find evidence that the Hybrid syndicate serves this purpose.

Despite disadvantages it has in underwriting for large issues and for issues with higher potential for conflicts of interest problem, commercial banks are found to possess better abilities in serving clients with certain attributes, such as firms with middle credit ratings[38] (Song, 1999). It would be implausible for commercial banks to not take advantage of their superior abilities when they expand into

---

issues, is too small to conduct multivariate analysis. For this analysis, the data is lumped in with other commercial bank lead syndicates. Thus, we focus our discussions on the three types of syndicates mentioned in the text.

[38] The issues with middle credit ratings are those with Moody's ratings of either A or Baa.

these segments of the market, given that lead managers gain a larger share of the proceeds. Thus, we hypothesize that commercial banks strategically select their entry mode - leading the syndicate or participating as a co-manager - based on their strengths in different segments of the market.

Using a sample of 1327 corporate bond issues from 1991 to 1996, we examine how issuing firms select among these three syndicates and how hybrid syndicates are different from CB-Lead and PureIB syndicates in terms of their underwriting abilities. We also analyze the performance of syndicates by subtracting the net yields of bond issues that selected syndicates obtain for their clients from predicted yields of unselected syndicates for the same clients. We find that in circumstances when the coalition arrangement is less beneficial to the commercial banks, they behave more aggressively in the market, having a higher tendency of choosing to lead a syndicate rather than to just participate in it. In the small issue market, where commercial banks display less distributional disadvantages, commercial banks lead-managed three times as many bond issues as they underwrote in the large issue market. They cooperate with another lead investment bank half as often in the small issue market as they do in the large issue market. Similar aggressive behavior is observed when commercial banks underwrite for firms with middle quality. They lead-underwrite a higher percentage of bond issues in the middle quality segment than in the high and low segments. These results support the hypothesis that commercial banks strategically select their entry modes.

We also find that the hybrid syndicate is distinctly different from both CB-Lead syndicates and PureIB syndicates on many dimensions. Clients of hybrid syndicates tend to be large issuers but not large firms. Hybrid clients are more profitable, have lower leverage, and are less likely to have an informational asymmetry problem. The purpose of their issues is more likely to be refinancing bank debt.

The superiority of a hybrid syndicate is demonstrated through its ability to achieve higher bond prices for different clientele. Most of the beta coefficients in the net yield equation for hybrid clients fall between those of CB-Lead and PureIB syndicates. These estimates tend to fall closer to estimates of one or the other type of syndicate. The hybrid coefficient estimates on leverage support the informational advantage argument due to the involvement of commercial banks. Meanwhile, the involvement of investment banks in the hybrid syndicate alleviate part of the informational monopoly problem inherent in CB-Lead syndicates, as demonstrated by the estimates on sales growth and operating income being closer to those of PureIB syndicates.

In addition, there are synergies with regards to volatility of equity return and Tobin's q. The hybrid estimates of the net yield equation for these two variables are the smallest of any group. Hybrid estimates of the net yield equation on equity trading volume and firm size resemble the averages of the other two parties. However, the hybrid syndicate performs the worst in the area of maturity of issue, with the estimate being the largest among the syndicates. Although both

CB-Lead and PureIB syndicates demonstrate cherry-picking ability[39] over hybrid

syndicates, there is no endogenous selection bias identified for hybrid

syndicates. One possible explanation is that hybrid clients are the group with less

of an informational problem. Thus, the identity of a syndicate can not provide

additional value when all exogenous characteristics of firms have been

considered.

Overall, we find that the hybrid structure can preserve the advantages of

commercial banks while mitigating many of their disadvantages. By cooperating

with an investment bank, which lead-manages the bond issue, potential conflicts

of interest of commercial banks can be reduced. The reputation of an investment

bank and the more remote distance between lending and underwriting activities

make the certification of the hybrid form more credible. Therefore, hybrid client

firms that issue bonds for the purpose of refinancing bank debt will suffer less of

a price discount than commercial bank-lead customers will.

We provide evidence that the hybrid structure is a superior organizational

form for many firms under current regulatory and market conditions. However,

the existence of client switching costs enables underwriters to have temporary

monopoly power over their clients. Not all of the customers have the privilege of

enjoying better syndicate services. Consistent with the characteristics of client

firms mentioned before, hybrid clients tend to have less informational asymmetry

problems, and, thus, lower switching costs.

---

[39] The cherry-picking ability refers to the informational advantage or unobserved ability of underwriters possess in that they are able to select clients they can serve better among firms with the same public known characteristics.

Our analysis of gross benefits, in terms of net yield differentials of bond issues, achieved by a chosen syndicate versus an unchosen syndicate supports the previous discussion. In the eyes of PureIB clients and most of the CB-Lead clients, the hybrid structure is a preferred choice. However, due to the existence of switching costs, these firms are still retained in less favorable syndicates. Among the three segments of issuing firms - high, middle, and low quality[40] - middle quality firms that are lead managed by commercial banks are the only group which do not prefer the hybrid syndicate. Middle quality firms are better off staying with a CB-Lead syndicate than switching to the hybrid form.

The remainder of the paper is organized as follows. Section 2.2 presents a review of the literature on entry of commercial banks into different financial markets and coalitions among underwriters. Section 2.3 describes the data and summary statistics. Section 2.4 discusses the entry strategies of commercial banks. Section 2.5 describes the characteristics of Hybrid syndicates in comparison to the other two syndicates. Finally, Section 2.6 concludes the paper.

---

[40] High quality firms are those with Moody's credit ratings of Aaa and Aa; middle quality firms are those with A and Baa ratings; low quality firms refer to those with Ba or below.

2.2   The Literature on Bank Entry Strategies and Underwriting Coalitions

Deregulation in the banking industry has provided numerous opportunities

for commercial banks to expand their scope of operations. Bhargava and Fraser

(1998) find positive abnormal returns for commercial banks when the Federal

Reserve Bank began authorizing commercial banks to provide limited forms of

security underwritings[41]. However, Bhargava and Fraser found that market

reaction to increased securities underwriting powers in 1989 was negative[42].

Nonetheless, the expansion of commercial banks into security underwritings has

grown rapidly since 1987. As of February 1, 1999, there were 51 section 20

subsidiaries. Among them, 41 were also authorized to conduct Tier II powers,

while 2 were limited to underwriting corporate debt issues[43].

Boot et al (1998) propose a theoretical framework to explain the

expansion of scale and scope in banking as an optimal strategy. They do so in

an environment of "strategic future skills uncertainty", where it is not known

whether the bank has the skills to compete effectively in new markets. In

contrast to merging with an investment bank, adding a section 20 subsidiary

allows commercial banks to acquire superior information regarding its

underwriting ability and to ascertain whether it has the skills to compete in the

---

[41] In 1987, three bank holding companies were granted the power to underwrite municipal revenue bonds, private mortgage-backed securities, commercial paper and consumer-receivable-related securities. These powers have come to be known as "Tier I section 20 powers". See Citicorp, J.P. Morgan & Co., and Bankers Trust New York Corp., 73 Federal Reserve Bulletin 473 (1987)(hereafter "1987 Order").
[42] The corporate security underwriting powers allowed in the 1989 Order have become known as "Tier II section 20 powers."
[43] For the list of section 20 subsidiaries, see "Section 20 Secruities Subsidiaries."

new business without an excessive up-front investment. However, due to current regulations, adding a section 20 subsidiary is the only feasible method for banks to enter the security underwriting business[44].

Given that commercial banks have entered the security underwriting business, they face two choices - competing or cooperating with investment banks. Since lead-managers may grab a large share of the underwriting compensation and build reputation for future underwriting business, it seems reasonable to assume that commercial banks would compete more aggressively in acquiring the lead-underwriter role when they possess stronger market power. Conversely, when they are a smaller player in a given market, it seems rational for them to cooperate with others who may complement their weakness. In the following paragraphs, we explore possible circumstances under which commercial banks may need to cooperate rather than to compete.

Kanatas and Qi (1998a) compare the level of information production and the amount of a client firm's investment in specialized versus integrated institutions. They find that the differences depend on the extent of borrower moral hazard, and the size of information costs. In related work, Kanatas and Qi (1998b) demonstrate that the incentive conflict of intermediaries who both lend and underwrite securities 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 opportunity cost of the incentive conflict and the savings from economies of scope are sufficiently large, there is a

---

[Online] Available http://www.bog.frb.fed.us/generalinfo/section20/, February 25, 1999.
[44] For a review of the consolidation of the financial services industry, see Berger et al

role for reputation building in mitigating the incentive conflict problem. This can be achieved without the need for regulation.

Another possible mechanism commercial banks may use to enhance their credibility is the choice of an organizational form that distances the operations of lending and underwriting. Kroszner and Rajan (1997) study the underwriting activities of commercial banks before the Glass-Steagall Act. In the absence of other distortions, their results suggest that in comparison to the in-house department underwriting, the organizational structure of a separate affiliate is an effective commitment mechanism to address the conflicts of interest problem. They argue that market pressures force banks to adopt an internal structure that might mitigate these concerns. In a similar study by Gompers and Lerner (1998), the authors examine the underwriting of initial public offerings by investment banks that hold equity in a firm through a venture capital subsidiary. Consistent with the rational discounting hypothesis, investors require a greater discount at the time of the offering to compensate them for potential adverse selection. The investment bank-affiliated venture firms address the potential conflict of interest by investing in and subsequently underwriting less information-sensitive issues.

Similar issues regarding the choice of organizational forms in dealing with different types of agency costs in the property-liability insurance industry are investigated by Cummins et al (1997). Their results support the hypothesis that the market will sort organizational forms into market segments where they have comparative advantages in minimizing the costs of production. By the same token, commercial banks may enter the security underwriting business by

---

(1999).

74

cooperating with a reputable investment bank to enlarge the distance between underwriting and lending when the concern for conflicts of interest perceived by the market is serious.

Pichler and Wilhelm (1998) provide a model explaining the economic functions of the syndicate organizational form. This form provides a monitoring role for the lead underwriter that improves incentives and mitigates the moral hazard problem. It is through the delegation of additional powers and, thus, additional responsibilities that the lead banker is effectively forced to put at risk the reputational capital on which its future earnings power depends. 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 lead bank reputation.

In relation to our study, an investment bank without a conflict of interest problem is more credible in certifying a security issue when the purpose of the issue is to repay bank debt. It may pay for a commercial bank to participate in a syndicate as a co-manager and to allow a reputable investment bank to refinance the client's bank debt. By putting its reputation capital on the line, the lead investment bank may capture a larger share of the proceeds, and, thus, increase the probability of the bank leading future offerings or participating in syndicates that it does not lead.

The discussions in the previous paragraphs demonstrate that there are strong theoretical grounds for positive economic effects of commercial bank entry into the security underwriting business. There are two factors that may induce commercial banks to cooperate with investment banks in securities underwritings. First, the aforementioned Federal Reserve revenue limitation hinders commercial banks from underwriting large issues. Second, investment banks have much more experience at these underwritings, putting commercial banks at a competitive disadvantage vis-à-vis investment banks. While the reasons for commercial banks to cooperate with investment banks are apparent, the reverse may not be so obvious. In the remainder of this section, we review the literature regarding the economic functions of syndicates and the possible reasons for coalitions among underwriters in the security underwriting business.

Anand and Galetovic (1998) provide an explanation for oligopolistic behavior in the investment banking industry when property rights over information are weak. They study the effect of entry on equilibrium market structures and prices, and show that collusion is robust to information free riding and entry; in contrast, monopoly is not robust to either. When inputs are non-excludable, cooperation between firms may be necessary for the market to exist. The authors also derive ranges of the size and number of intermediaries in equilibrium. If intermediaries are too small, then incentives to free ride become too large. Conversely, intermediaries can not be too large, since they would reduce others' market shares to the point that cooperation would no longer be sustainable. This framework is applicable to entry of commercial banks into the security

underwriting market, since commercial banks can offer services similar to those of investment banks.

Similar behavior of accommodating an entrant is observed in the discount department stores industry. Khanna and Tice (1998) study the expansion pattern of Wal-Mart, finding that the markets with high Herfindahl indices are the ones Wal-Mart can penetrate faster. These markets are dominated by large firms that tend to interact in multiple markets with Wal-Mart. Given this multi-market interaction, there is less of an information problem, and, thus, once entry takes place, incumbents are likely to cooperate with entrants.

Bhattacharyya and Nanda (1998) discuss similar issues regarding cooperative arrangements among investment banks in the context of the introduction of 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. In our paper, commercial banks are much smaller than investment banks in terms of market share. Alternatively, White (1996) argues that innovations can be organizational innovations involving new ways of doing things. In addition, Song (1999) find that commercial banks and investment banks possess differential comparative advantages in underwriting. Therefore, the formation of hybrid syndicates, which combine the complementary abilities of different underwriters, may provide a new breed of underwriting services. This new way of underwriting

would have never been available without the entry of commercial banks and the accommodation of investment banks.

Mohanram and Nanda (1998) study the stock market reaction to joint venture announcements in an effort to identify which types of joint ventures create value. They find that the stock market reacts positively to joint ventures that pool complementary resources together. Analogous to our study, if the cooperative arrangement between commercial banks and investment banks is a valuable form of conducting security underwriting, the prices of bonds underwritten by this hybrid form should be higher than if the same clients had been underwritten by either a commercial bank lead syndicate or a pure investment bank syndicate. Although the cooperation between commercial banks and investment banks could have existed before the Glass-Steagall Act, we are not aware of any study that investigates this interesting issue during the pre-Glass-Steagall era.

2.3　Data and Summary Statistics

The sample consists of 1327 public debt offerings[45] between January 1,

1991 and December 31, 1996. Data after 1996 is not included due to the

increase in the revenue limitation imposed on commercial bank underwriting

activities[46]. Financial companies and utilities are excluded from the sample.

Characteristics of the issues are obtained from the Security Data Corporation

(SDC) U.S. Debt New Issues Database, while firm characteristics are drawn from

Compustat and CRSP. In order to be included in our analysis, an issuing firm

must have data available on SDC, CRSP and Compustat. Definitions of variables

used in the analysis are listed in Appendix A.

The frequency and percentage of bond issues by year and underwriter types

during the period 1991 to 1996 are reported in Table 2.1, Panels A and B,

respectively. Over the six-year period, commercial banks lead managed 184

bond issues. Of the issues led by commercial banks, 155 issues did not have

other commercial banks involved as co-managers. These commercial bank lead

issues (*commercial bank-lead syndicates*) may or may not have had investment

banks involved. Twenty-nine issues did have other commercial banks involved as

co-managers (*commercial bank-coop syndicates*). There are no observations of

commercial bank-coop syndicates in our sample for 1991, 1992 or 1994. Ideally,

---

[45] Equity issues are not included in the sample due to an insufficient number of
observations of commercial bank lead underwritings.

[46] The revenue limitation was raised from 10 percent to 25 percent at the end of 1996.
See Federal Reserve System Docket No. R-0841, "Revenue Limit on Bank-Ineligible
Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and
Dealing in Securities."

we would like to analyze the commercial bank-coop category separately, but the number of issues is too few for multivariate analysis. Thus, in this section, we analyze these 29 issues as an independent category, but when we conduct the multivariate analysis in next section, these issues are lumped in with other commercial bank-lead-managed issues. In the next section we relabel this new category as *CB-Lead syndicate*. Additionally, there are 345 issues underwritten by the hybrid syndicate form. The hybrid form is the syndicate organizational form where an investment bank is the lead manager while a commercial bank is a co-manager. Finally, 798 issues are undertaken by pure investment bank syndicates (PureIB).

Over the sample period, the hybrid syndicate form has increased dramatically from underwriting 9.8 percent of bond issues in 1991 to 37.7 percent in 1996. This increase is at the expense of pure investment bank syndicates, who underwrote 86 percent of bond issues in 1991, but only 43.6 percent in 1996. Although the number of commercial bank-lead managed issues increased over the sample period regardless of whether other commercial banks were involved as co-managers, the percent of the total issues in the sample is relatively small. In fact, commercial bank-lead issues as a percent of total issues actually decreased in 1996.

The results indicate that commercial banks enter the market under two possible forms - as lead underwriters, or as co-managers. The latter form occurred twice as often as the former did. Thus, it appears that investment banks choose to accommodate entry rather than to deter it. One interesting question is

if a commercial bank is just another investment bank. Therefore, the observed accommodation of entry is the process of a natural oligopolistic market structure. Or there are special characteristics of commercial banks that cause them to stay competitive as lead underwriters when they possess advantages over investment banks and to ally themselves with investment banks as co-managers when they have weakness in certain markets.

The descriptive statistics reported in Table 2.2 demonstrate that commercial bank-lead syndicates underwrite the smallest issues in terms of the mean and median of issue size. Conversely, hybrid syndicates underwrite the largest issues. There is no observable difference of issue size between pure investment bank syndicates and commercial bank-coop syndicates. We do not observe the same pattern among different syndicates in terms of issuing firm size. Pure investment bank syndicates underwrite the largest mean and median size firms, while commercial bank-coops underwrite the smallest firms. Both commercial bank-lead and hybrid syndicates underwrite for middle size firms. The former underwrites relatively smaller firms than the latter on average, but there is no difference in median statistics. Thus, although hybrid syndicates underwrite the largest issue size, they do not serve the largest clients. In fact, pure investment bank syndicates serve the largest client firms. The smallest client firms are assisted by commercial bank-coops but their issue sizes are significantly larger than the issue sizes of the commercial bank-lead clients.

The net yields, or basis points spread (BPS), of bond issues highlight another pattern. While the bond issues of commercial bank-lead clients have the

lowest BPS, those of commercial bank-coops have the highest BPS. Although

the BPS of commercial bank-coop underwritten issues is significantly higher than

that of commercial bank-lead underwritten issues, it is not significantly different

from those of hybrid or pure investment bank underwritten issues. The latter two

syndicate forms do not differ from each other in terms of mean and median of

BPS, but the BPS of their client bond issues are both significantly larger than that

of commercial bank-lead syndicates. Due to the limited nature of univariate

analysis, we will analyze the interesting patterns observed in this section further

via multivariate analysis in Section 2.5.

2.4   The Entry Strategies of Commercial Banks

In this section, we continue our univariate analysis to identify systematic differences between syndicate forms. We then proceed to multivariate analysis in the next section. Table 2.3 displays the distributions of issue credit ratings by different types of syndicates. Regardless of the pairs we compare, all of the distributions are significantly different from each other. In the high quality segment, where the Moody's credit ratings are either Aaa or Aa, the dominant players are the hybrid and pure investment bank syndicates. The BPS of bond issues do not differ between these two syndicates nor among all syndicate types. The commercial bank-lead syndicates only underwrite 14 out of 187 (7.5%) high quality issues, indicating that they can not penetrate this particular market very well as a lead underwriter. There are 46 out of 187 (24.6%) high quality issues in which commercial banks participate as co-managers, which is slightly lower than for the overall sample (26%) when the market is not segmented by credit ratings. No issues in this segment are underwritten by commercial bank-coop syndicates.

In the middle quality category, where the Moody's credit ratings are either A or Baa, commercial bank-lead syndicates are able to lower BPS significantly more for their clients than hybrid or pure investment bank syndicates are able to. Commercial bank-lead syndicates underwrite 13.4% of these issues. This percentage is almost double that of the high quality firm segment. In fact, if we add the issues underwritten by commercial bank-coops, the number more than doubles. Among all the commercial bank-lead underwritten issues, 77.5 percent

of them are middle-rated firms, while for the hybrid underwritten issues and pure investment bank underwritten issues, the percentages are 62.4 and 67.9, respectively.

For those with B credit ratings, hybrid syndicates and commercial bank-coop syndicates show a comparative advantage over commercial bank-lead and pure investment bank syndicates in lowering BPS for their clients. In these low quality segments, i.e. Ba and below, the percentages of issues underwritten by hybrid and commercial bank-coop syndicates are 34 and 5.26, respectively. The percentage of issues underwritten by commercial bank-coops in the middle-rated category (1.79%), is one third that of the non-investment grade category. Conversely, hybrid syndicates underwrite 10 percent more issues in the non-investment grade segment than in the investment grade category.

The figures in Table 2.3 demonstrate a pattern of systematic selection of different syndicates by client firms. Investment banks continue to be the dominant players in the high quality segment. Commercial banks appear to be able to penetrate this market by cooperating with a lead investment bank. Commercial banks also lead-manage a larger proportion of the middle quality segment, where they show a comparative advantage in lowering the net yield of their clients' bond issues. In the non-investment grade market, where commercial bank-lead syndicates do not show a distinct advantage, cooperative arrangements with either investment banks or another commercial bank are the dominant strategies of entry for commercial banks. The specializations and different forms of entry by commercial banks indicate that a commercial bank is

not another "pure investment bank". If there were no difference between commercial banks and investment banks, we should not observe these systematic patterns of entry and selection.

In Table 2.4, we show the percentages of bonds underwritten by different types of syndicates in the small and large issue markets. These markets are segmented by the median size of issues of the entire sample. Thus, the small issue market contains issues that are less than 150 million dollars, while the large issue market has issues that are greater than or equal to 150 million dollars. In the small issue market, the percentage of commercial bank lead-managed bond issues is 18.6 percent on average, which is more than triple that of bond issues lead-managed by commercial banks in the large issue market. Conversely, the percentage of hybrid managed bond issues is on average 17.6 percent in the small issue market, while the percentage doubles for the large issue market.

The above pattern of entry into different issue size markets selected by commercial banks is consistent with the findings in Song (1999) that commercial banks show a disadvantage in handling large issues. If we combine the percentage of bond issues of hybrid syndicates and commercial bank lead syndicates, we find that commercial banks are actively engaging in the large issue market, but mainly by cooperating with an investment bank that may have a better distributional network and is not restricted by the 10 percent revenue limitation imposed on commercial banks.

Effective on November 12, 1996, commercial banks are allowed to exclude the interest earned on the ineligible securities from the 10 percent revenue limit[47]. 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 anticipated this change may increase their underwritings in 1996. As shown in Table 2.4, there is a shift of underwriting activities by commercial banks from the small to the large issue market. Issues managed by CB-Lead and hybrid syndicates in the small issue market declined dramatically in percentage terms from 1995 to 1996, while the opposite occurred in the large issue market.

Although the overall mean and median of the issue size of hybrid syndicate underwritten bonds are significantly larger than for any other form of syndicate, the firm size of hybrid syndicate clients is significantly smaller than that of pure investment bank syndicates in both mean and median. Compared to commercial bank lead syndicates, the firm size of hybrid syndicate clients is larger for means but no different for medians. However, examining the results of probit regression in Table 2.5, which analyze the pairwise syndicate selection, we find hybrid clients are significantly larger in firm size and in issue size than CB-Lead clients, but there is no difference between hybrid clients and PureIB clients in these two variables.

---

[47] See Federal Register, September 17, 1996, "10 Percent Revenue Limit on Bank-Ineligible Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and Dealing in Securities," volume 61(181):48953-48954.

Tables 2.6 and 2.7 report the results of net yields (BPS) regressions that demonstrate the underwriting ability of syndicates. we compare the beta coefficients of firm size, proxied by log of market value of equity. The coefficient estimate of firm size for hybrid syndicates is -27.32, which is smaller than that of PureIB syndicates in Table 2.7, but considerably larger than the CB-Lead estimate in Table 2.6. Thus, hybrid syndicates do not maintain the advantage that CB-Lead syndicates have shown in assisting large firms in lowering their net yields of bond issues. This may explain why hybrid syndicates do not underwrite for the largest firms even though its clients have the largest issue size.

In summary, the results support the hypothesis that the entry modes of commercial banks are strategically chosen. In the segment of middle quality firms where commercial bank show better ability, they behave more aggressively to acquire the lead-manager role. In the large issue market, where they are unable to handle large issues due to existing regulations, commercial banks tend to cooperate with investment banks.

2.5   The Characteristics of Hybrid Syndicates

The specialization of different syndicates mentioned in the previous sections

implies that underwriting abilities are different amongst the various syndicates. In

this section, we examine how these abilities are different based on firm and issue

characteristics and how the differences affect client firms. Due to the multiple

choices of syndicates and a potential endogenous selection problem,

polychotomous choice selectivity model would be the preferred choice of model.

However, parameter estimates in this model are very sensitive to distributional

assumptions[48]. Because of this lack of robustness in polychotomous choice

selectivity models, we apply a framework of switching regression analysis with

endogenous switching that involves analysis of two choices. We use pairwise

comparisons of different syndicates in the first-stage probit analysis. Thus, we

have three pairs of syndicates - CB-Lead versus Hybrid, CB-Lead versus PureIB,

and Hybrid versus PureIB - we need to consider. In the second stage, we

estimate the bond pricing equations, that is the net yield or BPS equations, for

each type of syndicate using an endogenous selection adjustment term

estimated from the first-stage probit[49].

---

[48] Chung (1997) applies polychotomous choice selectivity models, which allow for different distributional assumptions, to male wages in four sectors. The multiple selections of sectors are controlled for when the male wage equations are estimated. The results are quite different for different models and estimation methods.
[49] See Maddala (1983) for detailed discussions of both the switching regression with endogenous switching model and the two-stage estimation method, and Song et al (1999) for an application in the underwriter selection problem and discussions of variables used in the analysis.

2.5.1 The Determinants of Syndicate Selections

We analyze the selection of syndicates by probit models, presenting coefficient estimates in Table 2.5. We focus on the differences in selecting CB-Lead versus Hybrid and Hybrid versus PureIB syndicates, attempting to identify if the characteristics of hybrid syndicate clients are similar to CB-Lead, PureIB, or neither. The overall results indicate that these three types of syndicates are different from each other and that the hybrid syndicate is not the simple average of a commercial bank lead syndicate and a pure investment bank syndicate.

Hybrid syndicates are similar to commercial bank lead syndicates in terms of leverage, past 5-year sales growth, operating income, and cash reserves. Both syndicates are associated with firms that have lower leverage, grow slower, have higher operating income and higher cash reserves. All of the estimates of these variables are not significant for the CB-Lead vs. Hybrid regression, but they are all significant for the Hybrid vs. PureIB regression.

Hybrid syndicates resemble pure investment bank syndicates on the dimensions of equity trading volume, Tobin's q, firm size, issue size, and the interaction between high interest expense and the purpose of issue repaying bank debt. In comparison to CB-Lead clients, hybrid clients tend to have lower Tobin's q, to be larger firms, to be traded more frequently in the equity markets. Their clients also tend to issue bonds with larger size and fewer bonds with high interest expense for the purpose of refinancing bank debt than CB-Lead clients do.

A hybrid syndicate resembles neither a commercial bank lead syndicate nor a pure investment bank syndicate when maturity of issue, the purpose of issue and credit ratings are considered. These three syndicates are not significantly different in volatility of stock return, interest expense relative to operating income and reduction in long-term debt.

Based on the above results, we may characterize the clients of hybrid syndicates as firms with better quality, having higher profitability and cash reserves, lower leverage, and less of an informational problem, having lower Tobin's q, higher equity trading volume and larger firm size. They issue bonds of significantly larger size compared to issues underwritten by commercial bank lead syndicates. Hybrid syndicates' clients are more likely to issue debt to refinance existing bank debt with lower interest expense relative to operating income. Hybrid syndicate issues have longer maturity and they have a higher tendency to be non-investment grade.

The distinct characteristics of hybrid clients sheds some light on the possible economic rationales of cooperation between commercial banks and investment banks, and yielding an understanding of the role of commercial banks as co-managers in the security underwriting business. Given the aforementioned evidence on systematic selection of hybrid syndicates, a more thorough analysis of comparative advantages of hybrid syndicates over other forms is warranted. Therefore, we estimate the bond pricing, or BPS equations for different syndicates, analyzing their comparative advantages in the following subsection.

2.5.2 The Underwriting Abilities of Syndicates

We investigate the underwriting abilities of syndicates by estimating bond pricing equations in Tables 2.6 and 2.7. Regression results of the BPS equations for different syndicates are reported. Since we use net yields as the dependent variable in the BPS equation, the larger the beta coefficients, the lower the bond prices the syndicates can achieve for their clients.

In Table 2.6, we report two BPS regressions of CB-Lead syndicates with different endogenous selection adjustment terms, one estimated from the pair comparison of CB-Lead vs. PureIB (CB-Lead (1)), and the other from that of CB-Lead vs. Hybrid (CB-Lead (2)). The third set of regression results in Table 2.6 is for hybrid syndicates. Since there is no evidence of selection bias, we report only the estimates without the control of endogenous selection. For completeness, additional BPS regressions for hybrid syndicates with the control of selection bias are presented in Appendix B4. In Table 2.7, the estimates of all three possible regression specifications are presented for the PureIB syndicates.

We first examine if hybrid syndicates preserve the advantages of commercial banks. The proxy variables used in studying the informational and relationship-oriented advantages of commercial banks with their clients are leverage (total debt/total asset), equity trading volume, volatility of equity return, Tobin's q and an endogenous selection adjustment term. The estimate of leverage for hybrid clients is very similar to that for commercial bank lead clients, with both being negative and statistically insignificantly. This results indicate that

hybrid syndicate preserves the advantage of a commercial bank on the dimension of leverage. Conversely, the estimate for pure investment bank clients is positive and statistically significant. Based on the equity trading volume variable in Table 2.6, hybrid syndicates obtain bond prices for their clients that are very close to the simple averages of CB-Lead and PureIB syndicates. As for the estimates of volatility of equity return and Tobin's q, hybrid syndicates can do better than the other two types of syndicates. The estimates of these two variables for hybrid syndicate are the smallest among all types of syndicates.

The estimates of the endogenous selection adjustment terms for commercial bank lead syndicates are both negative and statistically significant regardless of the pair comparisons. When compared to CB-Lead syndicates, these estimates for both hybrid and PureIB syndicates are not statistically significant. One way to interpret the adjustment term of endogenous selection is as a proxy of private information extracted from the identity of syndicates. The negative estimates of CB-Lead syndicates[50] indicate that they can lower the net yields of their clients' bond issues further even though all other exogenous characteristics of firms have been controlled for. Thus, commercial banks can cherry-pick the clients they can serve better based on endogenous selection.

---

[50] The endogenous selection adjustment term has the form $\dfrac{\phi(Z\gamma)}{1-\Phi(Z\gamma)}$ for the syndicate when its assigned value as the dependent variable in the probit estimation is one. This term is estimated from the first stage probit regression. Since all numbers of this form will be positive, a negative regression coefficient for the BPS regression means a lowering of the net yield of bond issues. The adjustment term for the other syndicate is $\dfrac{-\phi(Z\gamma)}{\Phi(Z\gamma)}$ when its assigned value as dependent variable in the probit estimation is zero. Therefore, in order to lower the net yields of bond issues based on endogenous

In Appendix B4, we report two possible model specifications for the BPS equation of hybrid syndicate clients. None of the estimates for the endogenous selection terms are statistically significant, whereas, the estimate of this term in Table 2.7 - model PureIB (2) - is significantly positive. This indicates that PureIB syndicates demonstrate superior cherry-picking ability over hybrid syndicates. Therefore, PureIB syndicates seem to underwrite for clients that they can lower the net yield of bond issues due to the identity of syndicates. Thus, in terms of certifying private information that can only be revealed by the choice of underwriters, hybrid syndicates act like neither CB-Lead syndicates nor PureIB syndicates. One possible explanation for failing to establish an endogenous selection bias of hybrid syndicates is that the identity of underwriters is of less importance for hybrid clients. This is consistent with client characteristics that we identified in the previous subsection, who appear to be firms with less of an informational problem.

The second dimension of hybrid syndicates we would like to examine is their ability to reduce the monopoly power of information that banks have over client firms. Due to the fact that a commercial bank may appropriate its client's profits, a commercial bank is less credible than an investment bank in underwriting firms with higher growth and profitability. Thus, the clients of a hybrid syndicate are not subject to monopoly power as are clients of CB-Lead syndicates. Estimates from the BPS regression of hybrid syndicates on sales growth and operating income are in between those of CB-Lead and PureIB syndicates, leaning towards

---

selection, the regression coefficient for the BPS regression should be positive.

estimates from the PureIB syndicate regression. The results support the view that hybrid clients are free from the bank informational monopoly power.

The varying distances between lending and underwriting activities for different syndicate types may cause different levels of concern about conflicts of interest. There is no conflict of interest problem for a pure investment bank syndicate. However, there is serious concern about conflicts of interest under a CB-Lead syndicate. A hybrid syndicate should raise an intermediate amount of concern. The BPS regression estimates of the proxies for conflicts of interest demonstrate this pattern. If a hybrid client is issuing bonds for the purpose of refinancing bank debt, there is no increase in the net yield of a bond issue. By cooperating with a reputable investment bank that leads a syndicate, a commercial bank may effectively reduce these concerns. Nonetheless, at high levels of interest expense, both hybrid and commercial bank lead-managed issues have higher net yields. The hybrid syndicate is still less credible than the PureIB syndicate, which has no conflicts of interest problem like a CB-Lead syndicate does.

Consistent with the literature regarding the role of lead managers of a syndicate[51], the reputation of investment banks may mitigate conflict of interest problems that commercial banks have. Therefore, the coalition arrangement reduces the disadvantage that commercial banks have as underwriters and allows bond-issuing clients with high interest expense to refinance bank debt, thus partially avoiding a large price discount. This benefit of coalitions allows

---

[51] See Pichler and Wilhelm (1998), Nanda and Yun (1997) and Jain and Kini (1999) for discussions of the economic functions of a lead underwriter for the syndicate.

hybrid syndicates to underwrite more issues of bonds for the purpose of repaying bank debt than commercial bank lead syndicates could alone. The association with investment banks also allows firms to circumvent the bank informational monopoly power. Thus, bond-issuing clients reap the benefits of their association with commercial banks, while having the investment bank to lighten the negative impacts of bank relations.

In summary, we find that the characteristics of coalitions between commercial banks and investment banks are different from those of CB-Lead syndicates and the PureIB arrangement. The hybrid structure creates synergies beyond the simple average of the other two organizational forms, which should be beneficial to many firms in the economy. We continue our analysis by comparing the net yields that syndicates have obtained in serving existing clients to predicted numbers if clients were served by other syndicates.

2.5.3 The Performance of Syndicates

In Table 2.8, we compare the performance of different types of syndicates, presenting the gross benefits for clients utilizing services of selected syndicates. Gross benefits are defined as the expected mean net yield of bond issues had clients chosen an unselected syndicate minus the observed net yield of bond issues. If the resulting number is positive, then the chosen syndicate can acquire a lower net yield of bonds for its client than the unchosen syndicate could. If the net yield comparison is the only factor that is utilized in the selection of

syndicates, we should observe that all benefits are either positive or insignificantly different from zero. Unfortunately, information asymmetry in the capital markets may prevent clients from switching among different underwriters freely. The existence of switching costs causes some firms to be captured by their underwriters even though there are other types of syndicates that may achieve better bond prices for them. Thus, gross benefits may be negative before the consideration of switching costs even when better choices of underwriters exist in the market.

The results shown in Table 2.8 are the products of results from Tables 2.6 and 2.7. The PureIB (1) model, which controls for selection bias, in Table 2.7 is used to estimate the benefits of CB-Lead clients with respect to PureIB syndicates[52]. Panel A of Table 2.8 displays the results for CB-Lead clients had they used the services of hybrid and PureIB syndicates. Compared to the service of hybrid syndicates, the overall benefits for CB-Lead clients on average is negative and statistically insignificant. The negative benefits arise only for clients with high and low credit ratings. Thus, clients with high and low credit ratings would be better off if they were underwritten by hybrid syndicates. However, the group with middle credit ratings enjoys significant positive benefits by using the services of commercial bank lead syndicates. The results are consistent with the hypothesis that hybrid forms possess superior underwriting abilities in serving some CB-Lead clients, while CB-Lead syndicates are better in assisting middle

---

[52] We also repeat the same procedure by using model PureIB (3), which does not control for selection bias, and report the estimated benefits in Appendix B5. These results are essentially unchanged from those in Table 2.8.

quality firms. Thus, there seems to be a need for both syndicate forms to exist in order for different types of firms to acquire higher bond prices.

Compared to the services of PureIB syndicates, CB-Lead clients on average are significantly better off staying with their own underwriters. If a PureIB syndicate were used, only the estimated benefit for high quality clients is marginally significant. Additionally, all of the estimated benefits are larger than those for which a hybrid syndicate is used. Thus, from the point of view of CB-Lead clients, the hybrid structure is better than the pure investment bank form.

The results in Panel B of Table 2.8 show that hybrid clients appear to be a group of privileged customers. They fully enjoy the benefits of cooperation between commercial and investment banks, as of all the estimated benefits in Panel B of Table 2.8 are significantly positive. These results are robust to different model specifications. In Appendix B5, we do not control for the endogenous selection problem if a PureIB syndicate were the underwriter, with the results still supporting the view that a hybrid syndicate is a better choice for its clients.

Our analysis shows that the clients of pure investment banks on average should not use the services of a commercial bank lead syndicate, but should switch to a hybrid syndicate. The estimated benefits with respect to hybrid syndicates are all negative. Only non-investment grade firms are indifferent between these two types of syndicates. Compared to the characteristics of hybrid clients, PureIB clients are less profitable and have larger information asymmetry

problems. Thus, the switching costs for these firms may be higher than for those who switched to the hybrid syndicate.

In the eyes of PureIB clients, the underwriting ability of the hybrid syndicate is superior to that of a pure investment bank arrangement. Hence, the cooperation arrangement is not only beneficial to commercial banks, but also to investment banks. The creation of a new organizational form allows the incumbent investment banks to enhance their services further by accommodating the entry of competitors, who possess distinct comparative advantages. The economic motivation of investment banks explains why commercial banks are able to penetrate the security underwriting business so quickly by participating in a syndicate that is lead-managed by an investment bank.

2.6   Conclusion

In this paper, we add a new dimension to the research on commercial bank underwriting. Unlike the extant literature, which focuses only on underwriting activities when commercial banks are lead managers of a syndicate, we investigate the role of commercial banks as co-managers. We provide evidence consistent with the hypothesis that commercial banks strategically select their entry modes. In the segments where the underwriting abilities of commercial banks are hindered by the concerns for conflicts of interest and revenue constraints, they tend to ally with investment banks. Otherwise, they compete more aggressively in acquiring the lead role.

The benefits of bank entry are by no means limited to the cases when commercial banks lead the syndicates. The creation of a valuable 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 have likely understated the benefits of bank entry.

At the same time, hybrid syndicate is shown to preserve many advantages of the other two types of syndicates. In some cases, there are synergies created by a coalition arrangement. This superior organizational structure explains why commercial banks may penetrate the market so quickly while investment banks are willing to accommodate this entry. The cooperative arrangement has strong economic motivations, particularly for commercial banks, which strategically

choose the modes of entry depending on their underwriting strength in various markets.

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. Without the existence of an independent investment bank, firms falling into this category are forced to pool with those having conflict of interest problems, thus incurring a price discount that they would otherwise not incur. Consequently, these type of firms are suffering from the entry of commercial banks into the security underwriting business. Thus, the structure of the financial system is evolving in a way that is beneficial to many issuing firms under the current regulatory and market conditions.

APPENDIX 2

TABLES OF ESSAY 2

Table 2.1

The frequency and percentage of bond issues by year and by underwriter type

Total numbers and percentages of bond issues are reported in Panel A and B, respectively, by year and by underwriter type. *Commercial bank-lead* represents syndicates which have a commercial bank as the lead underwriter but no other commercial bank is involved in the issue. *Hybrid* represents syndicates which have an investment bank as the lead underwriter and other commercial banks are involved in an issue. *Pure investment bank* is syndicate in which there are no commercial banks involved and the lead underwriter is an investment bank. *Commercial bank-coop* represents syndicates in which the lead underwriter is a commercial bank and which has other commercial banks involved as a co-manager or part of the underwriting group.

Panel A.   The frequency of bond issues

Year	Commercial Bank-Lead	Hybrid	Pure Investment Bank	Commercial Bank-Coop	All-Types
1991	9	21	184	0	214
1992	25	53	170	0	248
1993	29	67	169	3	268
1994	20	41	74	0	135
1995	43	74	98	11	226
1996	29	89	103	15	236
1991-1996	155	345	798	29	1327

Table 2.1 (Cont'd)

Panel B. The percentage of bond issues

Year	Commercial Bank-Lead	Hybrid	Pure Investment Bank	Commercial Bank-Coop	All-Types
1991	4.2	9.8	86.0	0.0	100
1992	10.1	21.4	68.6	0.0	100
1993	10.8	25.0	63.1	1.1	100
1994	14.8	30.4	54.8	0.0	100
1995	19.0	32.7	43.4	4.9	100
1996	12.3	37.7	43.6	6.4	100
1991-1996	11.7	26.0	60.1	2.2	100

Table 2.2

Descriptive statistics of bond issue and firm characteristics by year and by underwriter type

The sizes and basis point spreads of bond issues are reported by year and by underwriter type. The size of firms is the market value of equity in billions dollars. The basis points spread 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.

Year	1991	1992	1993	1994	1995	1996	1991-1996
Mean Issue Size by Underwriter ($ million)							
Commercial bank-lead	144	91	86	68	47	114	82
Hybrid	233	215	174	200	203	235	209 [a]
Pure investment bank	169	200	196	135	159	149	175 [bd]
Commercial bank-co-op	*	*	150	*	106	179	148 [ce]
Median Issue Size by Underwriter ($ million)							
Commercial bank-lead	100	100	100	10	16	100	34
Hybrid	250	200	170	150	150	200	175 [a]
Pure investment bank	150	150	150	100	143	100	150 [bd]
Commercial bank-co-op	*	*	150	*	110	150	150 [ce]
Mean Issuer Firm Size by Underwriter ($ billion):							
Commercial bank-lead	8.97	10.18	5.58	5.58	6.93	5.23	6.83
Hybrid	11.49	7.78	5.87	7.42	9.98	10.77	8.84 [a]
Pure investment bank	12.79	10.77	11.80	12.27	9.04	12.15	11.56 [bd]
Commercial bank-co-op	*	*	1.63	*	3.81	0.65	2.98 [cef]

Table 2.2 (Cont'd)

Year	1991	1992	1993	1994	1995	1996	1991-1996
Median Issuer Firm Size by Underwriter ($ billion):							
Commercial bank-lead	2.75	9.44	4.03	4.55	2.25	3.31	3.93
Hybrid	6.85	2.44	2.67	2.23	3.47	6.79	3.79
Pure investment bank	5.35	3.30	5.55	5.11	3.75	6.67	4.85 [bd]
Commercial bank-co-op	*	*	1.87	*	3.86	2.00	2.08 [cef]
Mean Basis Point Spread for Issues Underwritten by							
Commercial bank-lead	92	142	114	113	116	79	111
Hybrid	150	151	152	181	107	120	137 [a]
Pure investment bank	117	163	157	137	139	101	138 [b]
Commercial bank-co-op	*	*	131	*	156	183	168 [c]
Median Basis Point Spread for Issues Underwritten by							
Commercial bank-lead	88	68	79	61	65	56	67
Hybrid	94	121	112	92	75	72	85 [a]
Pure investment bank	105	102	99	76	89	68	92 [b]
Commercial bank-co-op	*	*	69	*	84	155	85 [c]

[a,b,c] Significant difference in means or medians between Commercial Bank-Lead issues and Hybrid (Pure Investment Bank, Commercial Bank-Coop).
[d(e)] Significant difference in means or medians between Hybrid and Pure Investment Bank (Commercial Bank-Coop).
[f] Significant difference in means or medians between Pure Investment Bank and Commercial Bank-Coop.

Table 2.3

Issuer credit ratings distribution and basis point spreads by underwriter type

The basis points 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. The first column contains the proportion of the sample for each credit rating category, followed by the means and median of BPS for each credit rating category for the commercial bank-lead underwritten issues. Columns 4, 5, and 6 contains the same information as that in columns 1, 2, and 3 for hybrid underwritten issues. The remaining columns are defined in the same manner for pure investment bank and commercial bank-coop underwritten issues, respectively. The last three rows in the table contains the chi-square test and p-value in parentheses, with the null hypothesis being that the credit ratings distributions for issues underwritten by both underwriters are the same. CB stands for commercial bank, IB for investment bank.

Table 2.3

Moody's Credit Ratings	Commercial Bank-Lead			Hybrid			Pure Investment Bank			Commercial Bank-Coop		
	% of issue	Basis Point Spread		% of issue	Basis Point Spread		% of issue	Basis Point Spread		% of issue	Basis Point Spread	
		Mean	Median		Mean	Median		Mean	Median		Mean	Median
Aaa	0.0	*	*	2.9	44	40	1.4	57	61	0.0	*	*
Aa	9.0	53	53	10.4	55	55	14.5	56	49	0.0	*	*
A	53.6	58	55	35.7	72[b]	67[b]	42.5	83[ce]	79[ce]	17.2	54	61
Baa	23.9	95	92	26.7	103	95	25.4	140[ce]	121[ce]	37.9	71[df]	69[df]
Ba	5.8	208	212	13.0	244	225	8.3	287[ce]	265[ce]	31.0	262	270
B	7.7	528	502	10.7	393[b]	368[b]	7.3	450[ce]	439[e]	13.8	364[d]	376[d]
C or below[a]	0.0	*	*	0.6	493	493	0.6	283	225	0.0	*	*

Chi2(6)

	Commercial Bank-Lead		Hybrid		Pure Investment Bank	
Vs. Hybrid	20.40	(0.00)				
Vs. PureIB	10.75	(0.10)	18.12	(0.01)		
Vs. CB-Coop	28.13	(0.00)	14.14	(0.03)	28.35	(0.00)

[a] This category includes non-rated bonds.
[b(c,d)] Significant difference in means or medians between Commercial Bank-Lead issues and Hybrid (Pure Investment Bank, Commercial Bank-Coop).
[e(f)] Significant difference in means or medians between Hybrid and Pure Investment Bank (Commercial Bank-Coop).

Table 2.4
The percentage of bond issues by underwriter-type in the large issue and small issue markets

The percentages of bond issues by underwriter-type are reported in Panel A and B for the large issue and small issue markets, respectively. The issue size is segmented by the median (150 million dollars) size of issue of the entire sample. *Commercial bank-lead* represents syndicates which have a commercial bank as the lead underwriter but no other commercial bank is involved in the issue. *Hybrid* represents syndicates which have an investment bank as the lead underwriter and other commercial banks are involved in an issue. *Pure investment bank* is syndicate in which there are no commercial banks involved and the lead underwriter is an investment bank. *Commercial bank-coop* represents syndicates in which the lead underwriter is a commercial bank and which has other commercial banks involved as a co-manager or part of the underwriting group.

Panel A.   The percentage of bond issues in the large issue market

Year	Commercial Bank-Lead	Hybrid	Pure Investment Bank	Commercial Bank-Coop	All-Types
1991	3.2	12.6	84.3	0.0	100
1992	5.4	28.2	66.4	0.0	100
1993	4.8	30.1	63.7	1.4	100
1994	8.6	37.9	53.5	0.0	100
1995	4.1	42.3	50.5	3.1	100
1996	8.8	56.0	27.2	8.0	100
1991-1996	5.6	33.5	58.8	2.1	100

Table 2.4 (Cont'd)

Panel B. The percentage of bond issues in the small issue market

Year	Commercial Bank-Lead	Hybrid	Pure Investment Bank	Commercial Bank-Coop	All-Types
1991	5.8	5.8	88.5	0.0	100
1992	17.2	11.1	71.7	0.0	100
1993	18.0	18.9	62.3	0.8	100
1994	19.5	24.7	55.8	0.0	100
1995	30.2	25.6	38.0	6.2	100
1996	16.2	17.1	62.2	4.5	100
1991-1996	18.6	17.6	61.6	2.2	100

Table 2.5

Estimates of the determinants of syndicate selections

This table reports the pairwise probit estimates and p-values of t-test of underwriter selection equations. In column 1, the dependent variable (CB-Lead) is 1 if the lead underwriter is a commercial bank, and 0 if it is a hybrid, that is the lead underwriter is an investment bank and it cooperates with commercial banks. Hence, the remaining columns are defined in the same way. PureIB stands for the syndicate that only investment banks are involved. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. High interest indicator is a dummy variable, the assigned value is 1 if the level of interest expense relative to operating income is larger than the median of this variable. Refinance bank debt*interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. The estimates for the yearly dummies and constant terms are not reported though they are included.

Table 2.5

Dependent Variable	CB-Lead vs. Hybrid (CB-Lead = 1)		CB-Lead vs. PureIB (CB-Lead = 1)		Hybrid vs. PureIB (Hybrid = 1)	
Independent Variables	Estimate	P-value	Estimate	P-value	Estimate	P-value
Total debt/total assets	-0.005	0.30	-0.013	0.00	-0.007	0.02
Equity trading volume	-0.005	0.01	-0.004	0.02	0.001	0.38
Volatility of equity return (residuals)	-0.010	0.59	-0.037	0.08	-0.001	0.90
Maturity of issue	-0.027	0.00	-0.016	0.01	0.008	0.06
Sales growth (5-yr.)	0.004	0.31	-0.004	0.17	-0.007	0.00
Tobin's q	0.195	0.10	0.179	0.03	-0.043	0.53
Operating income/total assets	-0.004	0.78	0.014	0.21	0.015	0.09
Log(market value of equity)	-0.152	0.02	-0.119	0.02	0.040	0.30
Log(size of issue)	-0.123	0.00	-0.093	0.00	-0.002	0.91
Refinance bank debt (indicator variable)	-0.813	0.00	-0.428	0.01	0.263	0.03
Interest expense/operating income	0.478	0.27	-0.009	0.97	-0.286	0.17
Refinance bank debt * High interest indicator	0.447	0.08	0.197	0.40	-0.161	0.32
Credit rating	0.344	0.14	0.586	0.00	0.085	0.53
Non-investment grade	-0.841	0.01	-0.423	0.10	0.478	0.01
Cash/(total asset-cash)	0.001	0.68	0.009	0.00	0.007	0.02
Reduction in long-term debt	-0.003	0.47	-0.005	0.18	-0.001	0.61
Pseudo-R^2	0.14		0.17		0.08	
No. of observations	529		982		1143	

Table 2.6

Estimates of basis point spreads on bonds underwritten by CB-Lead and Hybrid syndicates.

Columns 1 to 6 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. In columns 1 to 4, the sample includes issues when a commercial bank is the lead underwriter (CB-Lead). Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. CB-Lead (1) uses the pair comparison of CB-Lead vs. PureIB syndicates. CB-Lead (2) uses that of CB-Lead vs. Hybrid syndicates. In columns 5 and 6, the sample includes only the hybrid-underwritten issues and the regression does not include endogenous adjustment term. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. Refinance bank debt*interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. The estimates for the yearly dummies and constant terms are not reported though they are included.

Table 2.6

Independent Variables	CB-Lead (1)		CB-Lead (2)		Hybrid	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Total debt/total assets	-0.41	0.25	-0.31	0.38	-0.38	0.11
Equity trading volume	-0.26	0.20	-0.38	0.11	0.19	0.01
Volatility of equity return (residuals)	8.63	0.00	9.12	0.00	2.41	0.00
Maturity of issue	0.59	0.33	-0.25	0.79	1.24	0.00
Sales growth (5-yr.)	0.77	0.00	1.10	0.00	0.13	0.57
Tobin's q	8.38	0.43	10.67	0.35	1.35	0.82
Operating income/total assets	0.18	0.87	-0.61	0.58	-1.77	0.02
Log(market value of equity)	-36.36	0.00	-39.61	0.00	-27.32	0.00
Log(size of issue)	8.28	0.07	3.10	0.63	6.90	0.25
Refinance bank debt (indicator variable)	-67.51	0.00	-94.17	0.00	-10.15	0.33
Interest expense/operating income	53.35	0.09	71.12	0.03	87.02	0.00
Refinance bank debt * Interest expense	101.14	0.02	126.03	0.01	10.94	0.71
Non-investment grade	150.94	0.00	115.83	0.00	159.18	0.00
Endogenous adjustment term	-75.54	0.03	-99.15	0.06	*	*
Adjusted R²	0.82		0.82		0.78	
No. of observations	184		184		345	

113

Table 2.7

Estimates of basis point spreads on bonds underwritten by PureIB syndicate.

Columns 1 to 6 report the beta coefficients of second-stage basis point spreads (BPS) regressions of PureIB syndicate and p-values of t-test. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. PureIB (1) uses the pair comparison of CB-Lead vs. PureIB syndicates. PureIB (2) uses that of Hybrid vs. PureIB syndicates. PureIB (3) does not include the endogenous adjustment term. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. Refinance bank debt*interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. The estimates for the yearly dummies and constant terms are not reported though they are included.

Table 2.7

Independent Variables	PureIB (1)		PureIB (2)		PureIB (3)	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Total debt/total assets	1.07	0.00	1.29	0.00	1.07	0.00
Equity trading volume	0.32	0.00	0.30	0.00	0.33	0.00
Volatility of equity return (residuals)	5.89	0.00	5.74	0.00	5.91	0.00
Maturity of issue	1.10	0.00	0.80	0.01	1.12	0.00
Sales growth (5-yr.)	-0.12	0.37	0.16	0.42	-0.12	0.37
Tobin's q	13.87	0.00	16.87	0.00	13.82	0.00
Operating income/total assets	-3.02	0.00	-3.72	0.00	-3.03	0.00
Log(market value of equity)	-20.39	0.00	-21.72	0.00	-20.27	0.00
Log(size of issue)	-0.49	0.85	-0.88	0.74	-0.46	0.86
Refinance bank debt (indicator variable)	-21.37	0.01	-30.57	0.00	-21.18	0.00
Interest expense/operating income	8.33	0.47	20.36	0.13	8.32	0.47
Refinance bank debt * Interest expense	35.52	0.01	38.37	0.01	35.51	0.01
Non-investment grade	149.21	0.00	124.93	0.00	149.10	0.00
Endogenous adjustment term	-0.89	0.95	56.87	0.07	*	*
Adjusted R^2	0.72		0.72		0.72	
No. of observations	798		798		798	

Table 2.8
Gross benefit for issuing firms by credit ratings using the service of chosen syndicate rather than that of unchosen syndicate.

The gross benefit is defined as the expected mean net yield (BPS) of bond issues, had they chosen the unselected syndicate minus the observed net yield of bond issues. The benefit estimated in column 1 (below the heading of Hybrid) is the predicted BPS of CB-Lead client by using the estimates of hybrid BPS regression reported in Table 2.6 minus the original BPS of CB-Lead client. Hence, the benefit in column 3 is estimated in the same way. CB-Lead stands for a commercial bank as the lead underwriter. Hybrid represents an investment bank as the lead underwriter while other commercial banks are involved in an issue. PureIB stands for the underwriter syndicate includes only investment banks. The p-value of t-test (two-tailed) is reported, the tested null hypothesis is the gross benefit is equal to zero.

Panel A. Gross benefit for clients of CB-Lead syndicate

Credit ratings	Hybrid		PureIB	
	Benefit	P-value	Benefit	P-value
All ratings	-3.63	0.46	8.23	0.10
No. of observations	184		184	
Aaa or Aa	-21.46	0.03	-8.75	0.14
No. of observations	14		14	
A or Baa	3.20	0.25	17.68	0.00
No. of observations	136		136	
Ba or below	-23.64	0.33	-22.59	0.36
No. of observations	34		34	

Panel B. Gross benefit for clients of hybrid syndicate

Credit ratings	CB-Lead		PureIB	
	Benefit	P-value	Benefit	P-value
All ratings	173.42	0.00	101.96	0.00
No. of observations	345		345	
Aaa or Aa	202.26	0.00	102.78	0.00
No. of observations	46		46	
A or Baa	168.39	0.00	100.98	0.00
No. of observations	215		215	
Ba or below	170.50	0.00	104.03	0.00
No. of observations	84		84	

Table 2.8 (Cont'd)

Panel C. Gross benefit for clients of PureIB syndicate.

Credit ratings	Hybrid		CB-Lead	
	Benefit	P-value	Benefit	P-value
All ratings	-11.10	0.00	137.08	0.00
No. of observations	798		798	
Aaa or Aa	-17.98	0.00	142.39	0.00
No. of observations	127		127	
A or Baa	-8.82	0.00	128.93	0.00
No. of observations	542		542	
Ba or below	-13.88	0.24	166.11	0.00
No. of observations	129		129	

APPENDICES

APPENDIX A

DATA DEFINITIONS

A.1 Issue Characteristics

CBL: A dummy variable that is 1 if the lead underwriter is a commercial bank; 0 otherwise. The commercial banks represent the section 20 subsidiaries of bank holding companies, which are permitted to underwrite corporate securities by the Federal Reserve Board.

Commercial Bank-Lead: If the lead underwriter is a commercial bank and there is no other commercial bank involved in the underwriting, then the assigned value is 1. Otherwise, it is 0. (There may or may not be an investment bank involved as a co-manager.)

Commercial Bank-Coop: If the lead underwriter is a commercial bank and there are other commercial banks involved in the underwriting, then the assigned value is 1; 0 otherwise.

CB-Lead: If the lead underwriter is a commercial bank with or without other commercial banks involved in the underwriting, the assigned value is 1; 0 otherwise. (This variable includes both Commercial Bank-Lead and Commercial Bank-Coop.)

Hybrid: If the lead underwriter is an investment bank and there are other commercial banks involved in the underwriting, the assigned value is 1; 0 otherwise.

PureIB: If the lead underwriter is an investment bank and there are no other

   commercial banks involved in the underwriting, the assigned value is 1; 0

   otherwise.

BPS: The basis points spread is the premium of the ex ante yield spread of a

   bond over the ex ante yield of a U.S. Treasury security of comparable

   maturity.

Size of issue: The size of issue is the principal amount in millions of dollars.

Maturity: It is the years to maturity.

Non-investment grade: A dummy variable that is 1 if the Moody's credit rating for

   the bond issue is Ba or below or not rated; 0 otherwise.

Credit rating: If the Moody's credit rating for the bond issue is Aaa or Aa, the

   assigned value is 1; if it is A or Baa, the value is 2, if it is non-investment

   grade, the assigned value is 3.

Refinance bank debt: A dummy variable that is 1 if the purpose of the issue is to

   refinance existing bank debt; 0 otherwise.

A.2 Firm Characteristics

Total assets: Total asset (AT) in millions dollars.

Interest expense relative to operating income: Interest expenses (XINT) divided

   by operating income before depreciation, depletion and amortization

   (OIBDP).

Firm size: Natural log of market value of equity (MKVAL) in millions dollars.

Operating income: Operating income before depreciation, depletion and

   amortization (OIBDP) divided by total assets, multiplied by 100.

Exchange listing: 1 means the stock of the company is listed on either NYSE or AMEX; 0 otherwise.

Leverage: It is defined by total debt (DT) divided by total assets, multiplied by 100.

Volatility of equity return: It is proxied by the variance of residuals from the market model, which is estimated over 120 trading trades prior to the issuing date. The return on the CRSP value-weighted index is used to proxy domestic market returns.

Equity trading volume: Average trading volume (3 years average, CSHTR3) divided by common shares outstanding (CSHO).

Tobin's q: It is defined by the book value of debt (DT) plus market value of equity divided by total assets.

Sales growth: The five-year lease square growth rate of sales (GSALE5).

Cash Reserves: It is defined by cash and cash equivalent (CHE) divided by total asset (AT) net of cash.

Reduction of long-term debt: Reduction of long term debt (DLTR) in the year of bond issuing divided by total assets multiplied by 100.

Refinance bank debt*high interest indicator: A dummy variable that is 1 if the purpose of issue is for refinancing bank debt and interest expense relative to operating income is above its median value.

Refinance bank debt*interest expense: The interaction term between refinance bank debt and interest expense relative to operating income.

DUM91: Yearly dummy for 1991. Hence, all other years are defined in the same way.

A.3 Estimated adjustment terms for the second stage regressions

M1: The adjustment term in Equation (9), that is, $\dfrac{\phi(Z\gamma)}{1-\Phi(Z\gamma)}$, which is estimated from the first stage probit regression for the subsample when its assigned value as dependent variable in the probit estimation is one.

M2: The adjustment term in Equation (10), that is, $\dfrac{-\phi(Z\gamma)}{\Phi(Z\gamma)}$, which is estimated from the first stage probit regression for the subsample when its assigned value as dependent variable in the probit estimation is zero.

APPENDIX B

TABLES

Appendix B1

Estimates of basis point spreads on bonds underwritten by the commercial banks or by investment banks with alternative model specifications.

The large issue market is defined as the new-bond market if the size of issue is greater than or equal to the median size of issue (150 million dollars). Columns 1 to 8 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. In columns 1 to 4, the sample includes only commercial bank underwritten issues. In columns 5 to 8, the sample includes only the investment bank underwritten issues. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. High interest indicator is a dummy variable, the assigned value is 1 if the level of interest expense relative to operating income is larger than the median of this variable. Refinance bank debt*Interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. The estimates for the yearly dummies and constant terms are not reported though they are included.

124

Appendix B1

Independent Variables	BPS(1) Commercial Bank Estimate	P-value	BPS(2) Commercial Bank Estimate	P-value	BPS (3) Investment Bank Estimate	P-value	BPS (4) Investment Bank Estimate	P-value
Total debt/total assets	-0.36	0.31	*	*	0.70	0.00	0.72	0.00
Equity trading volume	-0.25	0.18	*	*	0.28	0.00	0.29	0.00
Volatility of equity return (residuals)	9.23	0.00	8.65	0.00	3.86	0.00	3.90	0.00
Maturity of issue	0.90	0.11	0.84	0.14	1.05	0.00	1.06	0.00
Sales growth (5-yr.)	0.82	0.00	0.86	0.00	-0.06	0.57	-0.06	0.58
Tobin's q	6.24	0.53	*	*	12.93	0.00	12.73	0.00
Operating income/total assets	-0.11	0.92	*	*	-2.98	0.00	-2.98	0.00
Log(market value of equity)	-32.82	0.00	-32.62	0.00	-23.50	0.00	-23.23	0.00
Log(size of issue)	*	*	3.23	0.66	*	*	0.60	0.79
Refinance bank debt (indicator variable)	-60.92	0.00	-64.14	0.00	-17.24	0.01	-16.91	0.01
Interest expense/operating income	57.39	0.07	46.89	0.09	19.53	0.07	19.61	0.07
Refinance bank debt * Interest expense	98.02	0.02	109.51	0.01	28.78	0.02	28.69	0.03
Non-investment grade	148.75	0.00	143.15	0.00	154.77	0.00	154.44	0.00
Endogenous adjustment term	-65.82	0.00	-49.45	0.11	-2.53	0.70	*	*
Adjusted R²	0.82		0.82		0.73		0.73	
No. of observations	184		184		1143		1143	

Appendix B2

Small issue market: Estimates of basis point spreads on bonds underwritten by the commercial banks or by investment banks with alternative model specifications.

The small issue market is defined as the new-issue bond market if the size of issue is less than the median size of issue (150 million dollars). Columns 1 to 4 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. In column 1, the sample includes only commercial bank underwritten issues. In column 3, the sample includes only the investment bank underwritten issues. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. High interest indicator is a dummy variable, the assigned value is 1 if the level of interest expense relative to operating income is larger than the median of this variable. Refinance bank debt*Interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation. The estimates for the yearly dummies and constant terms are not reported though they are included.

126

Appendix B2

Independent Variables	BPS(1) Commercial Bank		BPS(2) Investment Bank	
	Estimate	P-value	Estimate	P-value
Total debt/total assets	*	*	0.68	0.00
Equity trading volume	*	*	0.16	0.05
Volatility of equity return (residuals)	12.79	0.00	4.40	0.00
Maturity of issue	1.57	0.00	1.73	0.00
Sales growth (5-yr.)	0.52	0.02	0.12	0.59
Tobin's q	*	*	14.73	0.02
Operating income/total assets	*	*	-4.86	0.00
Log(market value of equity)	-19.80	0.00	-23.92	0.00
Log(size of issue)	-3.43	0.27	-4.21	0.31
Refinance bank debt (indicator variable)	-9.06	0.62	-23.53	0.02
Interest expense/operating income	126.78	0.00	15.41	0.34
Refinance bank debt * Interest expense	44.13	0.27	24.34	0.28
Non-investment grade	102.68	0.00	168.85	0.00
Endogenous adjustment term	-33.76	0.02	*	*
Adjusted R²	0.88		0.73	
No. of observations	130		495	

Appendix B3
Gross benefit for firm using the service of chosen underwriter rather than that of unchosen underwriter: Estimated from alternative model specification.

The gross benefit is defined as the expected mean net yield (BPS) of bond issues, had they chosen the unselected underwriter minus the observed net yield of bond issues. The benefit estimated in column 1 (below the heading of Commercial Bank Clients) is the predicted BPS of commercial bank client by using the estimates of investment bank BPS regression (model 3) reported in Appendix B1 minus the original BPS of commercial bank client. Hence, the benefit in column 3 is estimated in the same way by using model 1 reported in Appendix B1. The p-value of t-test is reported, the tested null hypothesis is the gross benefit is equal to zero.

Panel A. Gross benefit of full sample and by subperiods.

Years	Commercial Bank Clients		Investment Bank Clients	
	Benefit	P-value	Benifit	P-value
1991-1996	3.56	0.48	128.39	0.00
No. of observations	184		1143	
1991-1993	0.55	0.93	133.54	0.00
No. of observations	66		664	
1994-1996	5.24	0.46	121.25	0.00
No. of observations	118		479	

Panel B. Gross benefit by credit ratings

Credit ratings	Commercial Bank Clients		Investment Bank Clients	
	Benefit	P-value	Benefit	P-value
Aaa or Aa	-15.09	0.02	139.21	0.00
No. of observations	14		173	
A or Baa	13.08	0.00	121.74	0.00
No. of observations	136		757	
Ba or below	-26.85	0.28	143.22	0.00
No. of observations	34		213	

Panel C. Gross benefit by the issue size (in million dollars)

Issue Size	Commercial Bank Clients		Investment Bank Clients	
	Benefit	P-value	Benefit	P-value
>= 150	-2.33	0.84	133.63	0.00
No. of observations	54		648	
< 150	6.00	0.27	121.52	0.00
No. of observations	130		495	

Estimates of additional basis point spreads regressions on bonds underwritten by hybrid syndicate with endogenous selection adjustment term.

Columns 1 to 4 report the beta coefficients of second-stage basis point spreads (BPS) regressions and p-values of t-test. The sample includes only the hybrid-underwritten issues. Endogenous adjustment terms used to control the endogenous selection biases are estimated from the first-stage probit estimation when CB-Lead syndicate is compared to Hybrid syndicate for Hybrid (1). That for Hybrid (2) is estimated from the comparison of Hybrid vs. PureIB syndicates. Credit rating is 1 if the Moody's credit rating for the bond issue is Aaa or Aa, the value is 2, if it is A or Baa, the value is 3, if it is non-investment grade. Non-investment grade is 1 if the Moody's credit rating for the bond issue is Ba or below or not rated, 0 otherwise. Tobin's q is defined by the book value of debt plus market value of equity divided by total assets. Refinance bank debt is a dummy variable that is 1 if the purpose of issue is to refinance existing bank debt, 0 otherwise. Refinance bank debt*interest expense is the interaction term of Refinance bank debt and interest expense relative to operating income. The estimates for the yearly dummies and constant terms are not reported though they are included.

Appendix B4

Independent Variables	Hybrid (1)		Hybrid (2)	
	Estimate	P-value	Estimate	P-value
Total debt/total assets	-0.43	0.07	-0.34	0.21
Equity trading volume	0.09	0.48	0.18	0.03
Volatility of equity return (residuals)	2.13	0.00	2.44	0.00
Maturity of issue	0.68	0.33	1.18	0.01
Sales growth (5-yr.)	0.22	0.38	0.18	0.52
Tobin's q	4.22	0.53	1.57	0.79
Operating income/total assets	-1.96	0.01	-1.91	0.03
Log(market value of equity)	-31.15	0.00	-27.42	0.00
Log(size of issue)	3.67	0.59	6.72	0.26
Refinance bank debt (indicator variable)	-24.80	0.19	-12.82	0.34
Interest expense/operating income	94.20	0.00	88.22	0.00
Refinance bank debt * Interest expense	20.07	0.52	13.70	0.66
Non-investment grade	149.73	0.00	153.62	0.00
Endogenous adjustment term	-28.23	0.35	16.21	0.76
Adjusted R²	0.78		0.78	
No. of observations	345		345	

Appendix B5
Additional estimation of gross benefit for issuing firms by credit ratings using the service of chosen syndicate rather than that of unchosen syndicate.

This table reports additional estimation of gross benefit by using the BPS regression of PureIB syndicate without the endogenous adjustment term. The benefit estimated in column 1 (below the heading of CB-Lead clients) is the predicted BPS of CB-Lead clients by using the estimates of regression PureIB (3) reported in Table 2.7 minus the original BPS of CB-Lead clients. Hence, the benefit in column 3 is estimated in the same way for Hybrid clients. CB-Lead stands for a commercial bank as the lead underwriter. Hybrid represents an investment bank as the lead underwriter while other commercial banks are involved in an issue. PureIB stands for the underwriter syndicate includes only investment banks. The p-value of t-test (two-tailed) is reported, the tested null hypothesis is the gross benefit is equal to zero.

Credit ratings	CB-Lead Clients		Hybrid Clients	
	Benefit	P-value	Benefit	P-value
All ratings	9.84	0.05	6.92	0.05
No. of observations	184		345	
Aaa or Aa	-7.24	0.22	10.00	0.38
No. of observations	14		46	
A or Baa	19.30	0.00	5.59	0.05
No. of observations	136		215	
Ba or below	-20.97	0.39	8.65	0.45
No. of observations	34		84	

BIBLIOGRAPHY

Bibliography

Anand, Bharat N. and Alexander Galetovic (1997), Information, non-excludability, and financial market structure, Working paper, Yale School of Management and Universidad de Chile.

Ang, James S. and Terry Richardson, 1994, The underwriting experience of commercial bank affiliates prior to the Glass-Steagall Act: A re-examination of evidence for passage of the act, Journal of Banking and Finance 18, 351-395.

Beatty, Randolph P. and Jay R. Ritter, 1986, Investment banking, reputation, and the underpricing of initial public offerings. Journal of Financial Economics 15, 213-232.

Berger, Allen N., Rebecca S. Demsetz and Philip E. Strahan (1999), The consolidation of the financial services industry: Causes, consequences, and implications for the future, Journal of Banking and Finance 23, 195-214.

Bharat, A. Jain and Omesh Kini, 1999, On investment banker monitoring in the new issues market, Journal of Banking and Finance 23: 49-84.

Bhargava, Rahul and Donald R. Fraser, 1998, On the wealth and risk effects of commercial bank expansion into securities underwriting: An analysis of Section 20 subsidiaries, Journal of Banking and Finance 22, 447-465.

Bhattacharyya, Sugato and Vikram Nanda, 1998, Client discretion, switching costs and financial innovation, Working paper, University of Michigan.

Billett Matthew Thayer, Mark J. Flannery, and Jon A. Garfinkel, 1995, The effect of lender identity on a borrowing firm's equity return, Journal of Finance 50, 699-718.

Boot, Arnoud W. A., Todd T. Milbourn and Anjan V. Thakor 1998, Expansion of banking scale and scope: Don't banks know the value of focus? Working paper, University of Amsterdam, London Business School, and University of Michigan.

Booth, James R. and Richard L. Smith, II, 1986, Capital raising, underwriting and the certification hypothesis, Journal of Financial Economics 15, 261-281.

Carey, Mark, Mitch Post and Steven A. Sharpe, 1998, Does corporate lending by banks and finance companies differ? Evidence on specialization in private debt contracting, Journal of Finance, 53(3), 845-878.

Chemmanur, Thomas J. and Paolo Fulghieri, 1994, Investment bank reputation, information production, and financial intermediation, Journal of Finance, 49(1), 57-79.

Chung, Ching-Fan, 1997, Estimating and testing polychotomous choice selectivity models under alternative distributional assumptions: Wages in the public and private sectors, Working paper, National Taiwan University.

Cummins, J. David, Mary A. Weiss and Hongmin Zi, 1997, Organizational form and efficiency: An analysis of stock and mutual property-liability insurers, Working Paper Series of the Wharton Financial Institutions Center.

Diamond, Douglas W., 1991, Monitoring and reputation: the choice between bank loans and directly placed debt, Journal of Political Economy, 99(4), 689-721.

Diamond, Douglas W., 1991a, Debt maturity structure and liquidity risk, Quarterly Journal of Economics 106, 709-737.

Eccles, Robert G. and Dwight B. Crane, 1988, Doing Deals: Investment Banks at Work, Harvard Business School Press.

Fama, Eugene F., 1985, What's different about banks?, Journal of Monetary Economics 15, 29-39.

Gande, Amar, Manju Puri Anthony Saunders, and Ingo Walter, 1997, Bank underwriting of debt securities: modern evidence, Review of Financial Studies, 10(4), 1175 -1202.

Gompers, Paul and Josh Lerner, 1998, Conflict of interest in the issuance of public securities: Evidence from venture capital, NBER Working Paper No. 6847.

Greenbaum, Stuart I., George Kanatas, and Itzhak Venezia, 1989, Equilibrium loan pricing under the bank-client relationship, Journal of Banking and Finance 13, 221-235.

Holland, John, 1994, Bank lending relationships and the complex nature of bank-corporate relations, Journal of Business Finance and Accounting, 21(3), 367-393.

Hamao, Yasushi and Takeo Hoshi, 1997, Bank Underwriting of Corporate Bonds: Evidence from Japan after 1994, Working Paper, Columbia University and Osaka University.

Houston, Joel and Christopher James, 1996, Bank information monopolies and the mix of private and public debt claims, Journal of Finance 51(5), 1863-1889.

Jain, Bharat A. and Omesh Kini, 1999, On investment banker monitoring in the new issues market, Journal of Banking and Finance 23, 49-84.

James, Christopher, 1987, Some evidence on the uniqueness of bank loans, Journal of Financial Economics 19, 217-235.

Johnson, James M and Robert E. Miller, 1988, Investment banker prestige and the underpricing of initial public offerings, Financial Management 17, 19-29.

Kanatas, George and Jianping, Qi, 1998a, Underwriting by Commercial Banks: Incentive Conflicts, Scope Economies, and Project Quality, Journal of Money, Credit, and Banking 30(1), 119-133.

Kanatas, George and Jianping, Qi, 1998b, Underwriting by Commercial Banks: Incentive Conflicts, Scope Economies, and Project Quality, Journal of Money, Credit, and Banking 30(1), 119-133.

Khanna, Naveen and Sheri Tice, 1998, Wal-Mart's easy targets: A test of the chain store paradox. Working paper, Michigan State University and Tulane University.

Kroszner, Randall S. 1998, Rethinking bank regulation: A review of the historical evidence, Journal of Applied Corporate Finance, Summer 1998, 48-58.

Kroszner, Randall S and Raghuram G. Rajan, 1997, Organization structure and credibility: evidence from commercial bank securities activities before the Glass-Steagall Act, Journal of Monetary Economics 39, 475-516.

Maddala G. S., 1983, "Models with self-selectivity", Chapter 9 in Limited Dependent and Qualitative Variables in Econometrics, Econometrics Society Monographs No. 3, Cambridge University Press.

Mohanram, Partha and Ashish Nanda, 1998, When do joint ventures create value, Working paper, Harvard Business School.

Nanda, Vikram and Vincent A. Warther, 1998, The price of loyalty: An empirical analysis of underwriting relationships and fees, Working paper, University of Michigan and University of Chicago.

Nanda, Vikram and Youngkeol Yun, 1997, Reputation and financial intermediation: An empirical investigation of the impact of the IPO mispricing on underwriter market value, Journal of Financial Intermediation, 6, 39-63.

Nayar, Nandkumar and Michael S. Rozeff, 1994, Ratings, commercial paper, and equity returns, Journal of Finance 49(4), 1431-1449.

Opler, Tim, Lee Pinkowitz, Rene Stulz, Rohan Williamson, 1999, The determinants and implications of corporate cash holdings, Journal of Financial Economics 52, 3-46.

Pichler, Pegaret and William Wilhelm, 1998, A theory of the syndicate: Form follows function, Working paper, Boston College.

Puri, Manju, 1994, The long-term default performance of bank underwritten security issues, Journal of Banking and Finance 18, 397-418.

Puri, Manju, 1996, Commercial banks in investment banking: conflict of interest or certification role?, Journal of Financial Economics 40, 373-401.

Rajan, Raghuram G., 1992, Insiders and outsiders: the choice between informed and arm's-length debt, Journal of Finance 47(4), 1367-1400.

Saunders, Anthony, 1999, Consolidation and universal banking, Journal of Banking and Finance 23, 693-695.

Sharpe, Steven A., 1990, Asymmetric information, bank lending, and implicit contracts: a stylized model of customer relationships, Journal of Finance 45(2), 1069-1087.

Song, Wei-ling, 1999, Bank-entry benefits and regulation distortion in the corporate security underwriting business, Doctoral dissertation, Michigan State University.

Titman, Sheridan and Brett Trueman, 1986, Information quality and the valuation of new issues, Journal of Accounting and Economics 8, 159-172,

White, Lawrence, 1996, Technological change, financial innovation, and financial regulation in the U.S.: The challenges for public policy, Working paper, Stanford University.