Benefits and Costs of the Entry of Universal Banks into the Corporate Debt Securities Underwriting Market

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Abstract:

The repeal of Glass-Steagall Act in 1999 led to the substantial consolidation of the financial services industry. This study examines the costs and benefits of such a deregulation through examining the effects of the entry of universal banks into the corporate debt securities market. Examining debt securities issuances in the United States from 1999 to 2004, I present the case that universal banks possess different underwriting technologies from investment banks that enable them to underwrite debt securities at lower yield spread and lower gross spread. This provides them with competitive advantage and helps them to quickly gain significant market share from investment banks that have dominated the industry for the past century. However, my research also finds evidence of potential conflict of interest from establishment of banking relationships between universal banks and other firms. This calls for supervision and implementation of stricter firewalls from the regulatory body.

Introduction:

The financial system is one of the most heavily regulated sectors of the American economy. These regulations are aimed at making more information available to the public and ensuring the soundness of the financial system. A well functioning financial market has a major impact on every sector of the economy and, therefore, has significant influences on the growth and development of an economy. However, there is a general belief that a financial system does not function efficiently when left on its own due to manipulation by profit-seeking individuals. Subsequently, regulation of the financial system, especially the banking system is commonly seen across different nations. However, there is no clear evidence whether heavier regulation will enhance or reduce financial market efficiency. As a result, the enactment of the Glass-Steagall provision in 1933 and its repeal in 1999 create an interesting opportunity for the study of costs and benefits of regulation and deregulation of the financial services industry.

The enactment of the Glass -Steagall provision can be linked to a long period of financial crisis back in the early 1930s. After the Great Depression years of 1930-1933, there was a common belief among the public that the speculative behaviors of commercial banks in the stock market were the reasons for many bank failures. In addition, commingling of the functions of lending and securities underwriting by commercial banks was believed to create potential conflict of interest detrimental to the interest of investors. As a result, the Glass-Steagall provision of the Banking Act was enacted in 1933 to prohibit commercial banks from underwriting, holding or dealing in

corporate securities, either directly or through securities affiliates.[1] (Mullineaux et al., 2000) On the other hand, investment banks and insurance companies were prohibited from engaging in commercial banking activities to protect commercial banks from competition.

However, the Glass-Steagall provision was repealed in 1999 due to evidence of inefficiency it created in the banking industry. During the 1970s and 1980s, reexamination of the events back in the 1930s resulted in the discovery that the involvement of commercial banks in securities activities was not responsible for the collapse of the banking system during the Great Depression. In addition, decrease in profitability of traditional commercial banking businesses prompted mounting dissatisfaction with the Glass-Steagall provision. (Barth et al., 2000a) As a result, the Federal Reserve modified its interpretation of Section 20 of the Glass-Steagall provision in 1986 to allowthe Section 20 subsidiaries of commercial banks, including J.P. Morgan and Bankers Trust Co., to underwrite and deal in certain bank ineligible securities.[2] (Mullineaux et al., 2000) Apart from being subjected to a substantial set of firewalls that limit information, resource and financial linkages between them and their parent holding companies, the Section 20 subsidiaries were limited to generating a maximum of five percent of their gross revenues from underwriting corporate securities. Subsequently, this limit was raised by the Federal Reserve to 10 percent in 1989 and 25 percent in 1997. Apart from the above, the Federal Reserve also eliminated some firewalls and increased

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[1] The Glass-Steagall provision originally allowed subsidiaries of commercial banks, which were called "Section 20 subsidiaries" to underwrite US Treasuries, US agency securities and general-obligation municipal securities.

[2] In 1986, Section 20 subsidiaries of commercial banks were allowed to underwrite and deal in commercial paper, certain municipal revenue bonds, conventional mortgage-related securities and securitized consumer loans.

the set of allowable underwritings to include corporate bond as well as equity securities. (Mullineaux et al., 2000) Finally, formation of Citigroup from the merger of Citicorp, which was the second largest bank in the US and Travelers Group, an insurance company that also owned the third largest securities firm in the country (Salomon Smith Barney), put enough pressure on the regulators to result in the repeal of Glass-Steagall provision in 1999 with the enactment of Gramm-Leach-Bliley Financial Services Modernization Act (GLBA). Consequently, GLBA allows banks, insurance companies, securities firms and real estate firms to purchase businesses or get involved in areas previously prohibited by Glass-Steagall, resulting in substantial consolidation of the financial services industry. (Barth et al., 2000a)

With the advent of the universal banking model[3], which combines commercial banking activities, investment banking activities and other financial services under the same holding company, the convenience of "one-stop shopping" for a variety of financial services has rapidly gained popularity. Subsequently, the ability of traditional investment banks to compete effectively has been quickly called into question. In fact, a substantial decline in the size and market value of some of the top investment banks on Wall Street has been witnessed recently. For example, Merrill Lynch, which is one of the top investment banks on Wall Street, shed 23,000 jobs from their total workforce of 72,000 worldwide since its peak performance in 2000, and its market value declined 20 percent from its high this year. Morgan Stanley, another top investment bank on Wall Street, also lost 23 percent of its market value from its high this year. (Thomas, 2004) As a result,

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[3] The universal banking model can be formed as a result of merger and acquisition of different financial services firms or it can be a result of organic growth within the firm. This banking model is a direct result of the repeal of Glass-Steagall provision.

there has been a lot of uncertainty regarding the survival of traditional investment banks which are facing increasingly tough competition from universal banks.

The evidence of investment banks losing their foothold in the industry that they had dominated for over six decades raises the question of whether the repeal of Glass-Steagall has ultimately benefited the public through increased competition from universal banks. It raises further questions regarding the ways that these potential benefits are channeled to different groups of clients. My research will focus specifically on the corporate debt securities underwriting market and address these questions by examining the differences in pricing and other characteristics of corporate debt securities underwritten by universal banks and investment banks since the repeal of Glass-Steagall in 1999.

Literature Review:

Corporate Securities Underwriting by Universal Banks: Certification Effect or Conflict of Interest?

There are various perceived costs and benefits from allowing entry of commercial banks[4] into investment banking activities through the repeal of the Glass-Steagall provision. One of the major alleged costs from such entry is the possible conflict of interest through the commingling of commercial banking activities and investment banking activities which will ultimately be detrimental to publicinvestors . Conflict of interest is the situation where a bank with both investment and commercial banking

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[4] Commercial bank and universal bank are names that are used interchangeably in this paper, but there are slight differences in the bank structures. Prior to the repeal of Glass-Steagall in 1999, commercial banks possessed "Section 20 subsidiaries" which handle the underwriting of corporate debt securities. After the repeal of Glass-Steagall in 1999, universal banks have separate divisions that handle all investment banking activities.

function has the incentive to misuse private information gained from their lending activities to their own advantage. For example, a commercial bank may have the incentive to underwrite and misrepresent the quality of the securities of a firm to obtain repayment of outstanding non-performing loans it previously extended to that firm. The 1929 case of Fox Motion Picture Company[5] is a clear example of public investors subjected to manipulation due to conflict of interest between different functions of banks. (Kroszner et al., 1994)

However, empirical evidence from examining *ex post* default performance of debt as well as equity issuances during 1921 and 1929 suggests that public investors and rating agencies are actually well aware of such potential for conflict of interest due to commingling of different banking functions. Even if investors might not have complete information, such suspicion of conflict of interest causes the market to rationally impose "lemons market" discount on the securities underwritten by these banks. (Kroszner et al., 1994) As a result, commercial banks cannot systematically fool the public investors regarding the quality of underwritten securities issues. In fact, such a discount factor acts as a monitoring signal and may help securities underwritten by commercial banks to perform better than securities underwritten by investment banks.

Apart from the above, a study examining *ex ante* pricing of corporate debt securities issued from 1993 to 1995 finds that investors do not perceive a potential conflict of interest even when a security issuance is used to repay bank debts. (Gande et al., 1997) The two studies mentioned above use different approaches and different time

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[5] After Chase National Bank extended a $15 million loan to General Theaters and Equipment (GTE) to finance part of its purchase of the Fox Motion Picture Company in 1929, Chase Securities Company underwrote another $23 million of common stock and $30 million of debentures for GTE in 1930. GTE used part of these to repay the bank loan from Chase. In 1931, Chase Securities underwrote another $30 million in debentures to the financially distressed GTE. Two years later, GTE declared bankruptcy.

periods in studying the effect of commercial banks underwriting. The first study uses default rates of securities underwritten back in 1920s because such data is available due to the passage of time. The second study uses pricing differentials at the time of securities issuance between 1993 and 1995, which also reflect expected future default rates. The results are slightly different in that the first study shows that the public investors are aware of the potential for conflict of interest from commercial banks' participation in corporate securities underwriting and they act accordingly to protect their interest. On the other hand, the second study shows that conflict of interest is not perceived by investors to be a cost of the commercial banks' participation in corporate securities underwriting.

An offsetting argument to the conflict of interest effect is the certification effect, which is the perceived monitoring advantage and the additional credit information about the firms available to the underwriting banks due to their lending activities. For example, an underwriting bank which has previously extended loans to a firm will have additional information regarding the firm through scrutiny of internal budget statements and inspection of plant equipment, and inventory. Subsequently, the underwriter will be in a better position to certify the financial situation of the firm and this helps the firm to obtain higher prices, and thus lower yields, when raising debt capital from the public. On the other hand, public investors will benefit from a better performing firm due to close monitoring by the underwriter bank which extended loans to the firm.

A study that examines *ex* ante pricing of debt and equity securities issued during 1927 to 1929 finds thatfor more junior and information sensitive securities, there is a

higher net certification effect in the form of higher prices or tighter yield spreads[6] of

industrial bonds and preferred stock. (Puri, 1996) This is because riskier securities are

more sensitive to information that can affect firm value and thus investors will be willing

to pay a higher price for the net certification effect due to the lending activities of the

underwriter. Examining corporate debt securities underwritten by both commercial banks

and investment banks between 1993 and 1995, Gande et al. (1997) also find similar

evidence for debt securities underwritten by commercial banks for lower credit firms with

which they have lending relationships. Apart from the above, Datta, Iskandar-Datta and

Patel (1999), who studied initial public straight debt offers made by U.S. corporations

between 1971 and 1994, also find that bank debt lowers the yield spread for a firm's

initial public debt issuance. These results suggest that net certification effect is perceived

by investors to be a benefit from commercial banks' participation in securities

underwriting. On the other hand, Mullineaux and Roten (2000) find no evidence that

prior lending relationship influences underwriting yields by examining corporate debt

issuances between 1995 and 1998. Their result provides a contradiction to previous

literatures, indicating that prior lending relationship does not results in certification effect.

A limitation of these prior studies is that they do not account for loans extended

by investment banks. Stand-alone investment banks are actually entering into the

commercial lending business with a particular focus on syndicated loans in order to

compete more effectively against universal banks.[7] Since empirical study has shown that

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[6] Yield spread here refers to the difference between yield of corporate bonds and yield of treasury bonds due to the risk involved in owning corporate bonds. Higher price or tighter yield spread means that firms can raise cheaper funds through commercial bank underwriters compared to investment bank underwriters.
[7] Some investment banks like Merrill Lynch and Morgan Stanley currently have subsidiaries that were chartered in Utah as industrial loan companies. On the other hand, other investment banks like Lehman Brothers hold a federal savings bank charter.

there are differences in loan pricing models at investment banks and commercial banks, the extension of loans and securities underwriting by investment bank can be examined to determine if the certification role of investment banks exists and if it is different from that of commercial banks. (Harjoto et al., 2004)

Corporate Securities Underwriting by Universal Banks: Improvement in Underwriting Technologies?

Improvement in underwriting technologies is also a perceived benefit from the entry of commercial banks into investment banking activities. As new entrants into the corporate securities underwriting business, commercial banks possess different underwriting technology due to the larger platform that they possess from their commercial banking activities. Apart from the potential certification effect that they can provide as discussed above, they also possess superior information due to the provision of diverse financial services through their larger platforms. This can prove beneficial for firms with information problems, including first time issuers and smaller and lesser known firms. In addition, their larger platform also allows them to provide significant economies of scope by reducing information costs and to provide better financing options to their clients. (Kanatas et al., 1998) Consequently, they might possess a comparative advantage in serving certain types of clientele or they might possess an absolute advantage in securities underwriting. With improvement in underwriting technologies, the underwriter will be able to obtain higher prices or lower yield for issuers, and, as a result, issues will be able to raise capital at less cost. This is a clear benefit for firms who are clients of corporate securities underwriting.

In this respect, empirical evidence from using examination of debt and equity issuance between 1921 and 1929 suggests that commercial banks and investment banks can both efficiently provide underwriting services for large and well-known firms. On the other hand, commercial banks are at a disadvantage while competing to underwrite securities for smaller and lesser known firms. This is because these securities have less publicly available information and are regarded as more information-intensive securities. As a result, public markets and rating agencies perceive a potential for conflict of interest for commercial banks and impose a "lemons market" discount on issues underwritten by commercial banks as discussed before. (Kroszner et al., 1994) This seems to suggest that ceteris paribus, investment banks possess better underwriting technologies in serving smaller clients as they lack the potential for conflict of interest. On the other hand, they can serve the bigger clients just as well as the commercial banks. As a result, investment banks can be seen as having an absolute advantage in the corporate debt securities underwriting business because of their leaner operation which rid them of the problems of conflict of interest. Puri (1996), on the other hand, finds thatbetween 1927 and 1929 in the immediate pre-Glass-Steagall period, commercial bank underwritten corporate debt securities obtained higher prices than those obtained by similar investment banks underwritten securities, even after controlling for selectivity bias. This result suggests that commercial banks are the ones with absolute advantage in the corporate debt securities underwriting business.

The conflicting result discussed above is mainly due to the fundamental differences in the dataset used by authors of these studies. While the first study uses *ex post* default rates of debt as well as equity securities, the second study uses *ex ante*

pricing of debt securities only. The second study also uses data from a longer time period. In addition to the above, the authors also use different approach in reaching their conclusions. The first study finds thatclients of commercial banks with low ratings defaulted less than clients of investment banks with similar ratings. Thus, they believe that commercial banks cannot obtain fair ratings for their smaller and lesser known clients due to the potential for conflict of interest. Consequently, they conclude indirectly that commercial banks are at a disadvantage while serving smaller clients. This argument is not convincing because a significant amount of time had elapsed between underwriting the securities and the securities defaulting, thereby making *ex post* performance of these securities a less accurate proxy to gauge the performance of the underwriters. Better underwriting technologies are best reflected in higher prices of the securities due to higher demand, and as a result, *ex ante* pricing provides the most direct way for evaluating the underwriting technologies of the banks.

Examining debt issuance between 1993 and 1995, Gande et al. (1997) find that commercial bank underwriting only resulted in higher yield for debt securities of lower credit rated firms which is consistent with the certification effect. In addition, they find that commercial banks bring a relatively larger proportion of smaller issues to the market, indicating that commercial banks can better serve smaller firms with additional need for cheaper commercial loans. Hence, the authors conclude that commercial banks possess the absolute advantage in corporate securities underwriting business. However, the authors do not account for the fact that commercial banks are still relatively new entrants into the corporate debt securities underwriting business when reaching the above conclusion. Apart from being subjected to certain regulations, they might be facing

severe restraints in terms of their personnel, their underwriting technologies and distribution network during this period of time. In particular, restriction on revenue generated from investment banking activities during this time period and the lack of distribution network can compel commercial banks to underwrite smaller issues. This might give off the false sense that commercial banks are better in serving smaller firms. This argument is consistent with Mullineaux and Roten's (2000) results. Examining debt securities underwritten by commercial banks between 1995 and 1998, they find that yield spreads are not lower due to commercial bank underwriting. This result contradicts previous literature and suggests that commercial banks do not have an absolute advantage in securities underwriting.

Song (2003) points out that the methodology employed by previous literature only allows one type of bank to possess the absolute advantage in corporate debt securities underwriting and does not permit each underwriter to possess different comparative advantages in serving different clienteles. Using data on corporate debt issuances between 1991 and 2000, she finds that conditional on underwriter selections, the bond yield spreads are lower for both commercial banks and investment banks. This demonstrates thatboth types of banks have comparative advantages in underwriting corporate debt securities for certain groups of clients. For example, commercial banks, as a result of combined lending and underwriting capabilities, can obtain higher prices on debt securities for firms with severe financial constraints due to lower cash holdings and less capital investment. Her finding shows that "firms rationally select between underwriter types, seeking to minimize the total costs of bond issuance". (Song, 2003)

However, Song's study was done using the data encompassing the entire period of 1990s. Significant time has elapsed since the repeal of Glass-Steagall and the business environment has changed significantly since then due to the changes in the regulatory regime. With the current model of universal banks and investment banks crossing into each other's territories to offer similar financial services, it is unclear if each type of bank still possesses a comparative advantage in serving different groups of clienteles and if the differences in pricing of debt securities are still so pronounced. Subsequently, a study using data since the repeal of Glass-Steagall will more accurately describe the current situation in the corporate debt securities underwriting business.

In addition to the above, Song (2003) also finds that, on average, investment banks would have obtained higher bond prices for all clients if compared to commercial banks. This is the result from her estimated unconditional mean yield spreads, assuming only one type of underwriter had existed. This seems to suggest that even though commercial banks and investment banks have comparative advantages in serving different clients, investment banks still have the absolute advantage in underwriting corporate debt securities.

On the other hand, another perceived cost from the entry of commercial banks into investment banking activities is the potential inefficiency from the entrenchment of monopoly power of commercial banks over firms with information asymmetry problems. The monopoly power over these firms' private information can be established because these firms cannot signal future prospects credibly. (Song, 2003) Such a monopoly power, even though temporary, allows the commercial banks to expropriate the firms' future earnings, which can be detrimental to the profitability of the firms. As a result, as a firm

gains size and reputation, it will tend to avoid the monopoly power of commercial banks over its private information. In this respect, Song (2003) finds evidence that issuers with better reputation, better prospects and higher profitability are less likely to choose commercial banks as the underwriters.

Corporate Securities Underwriting by Universal Banks: Decrease in Underwriting Fees?

Finally, a decrease in gross spread[8] is another perceived advantage due to the entry of commercial banks into the securities underwriting business. With an increase in competition from commercial banks, the fee for underwriter (gross spread) should be lower. This will benefit the firms because they are obtaining underwriting services at lower prices. Empirical evidence by Mullineaux and Roten (2000) shows that gross spreads are lower for debt securities underwritten by commercial banks between 1995 and 1998. However, the fact that commercial banks are still relatively new entrants into the corporate debt securities underwriting business is again not taken into account. A lower gross spread might merely mean that commercial banks are offering cheaper fees for their services in order to compete against investment banks to establish their foothold in the corporate securities underwriting business.

On the other hand, after the repeal of Glass-Steagall, universal banks should have already established a foothold in the corporate debt securities underwriting business. This is because successive relaxations and the subsequent repeal of Glass-Steagall have helped universal banks to grow their investment banking function rapidly through merger and acquisition or organic growth. As a result, a test using data after the repeal of Glass-

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[8] Gross spread here refers to the difference between the offered amount and the proceeds to the issuer as a percentage of the issue size. This is the fee for the underwriter.

Steagall should yield a more convincing result on the competitive effect on gross spread from universal banks underwriting debts.

In addition to the above, most of the authors of previous studies also fail to account for general movements in the fixed income market. This might constitute an omitted variable bias in their regressions.

Testable Hypotheses:

As evident from the above review of previous literatures, there are numerous testable hypotheses for this research project. As a result, these hypotheses are categorized into three separate groups according to the nature of the tests required for analyzing these hypotheses.

Group 1

The first group of testable hypotheses centers on the deciding factors for an issuer to choose one type of bank over another as its underwriter. I will first test the hypothesis that smaller and lesser known firms with little credit information available on the market will choose universal banks as their underwriters to take advantage of the certification effect through the universal banks' superior information. Another testable hypothesis regarding the universal banks' superior information is whether first time issuers, who have similar information problems like the smaller and lesser known firms, will choose universal banks as their underwriters.

In addition, I will test the hypothesis that universal banks can better serve firms with severe financial constraints as they offer better future financing options. I will also

verify the universal banks' monopoly power hypothesis by examining if issuers with better reputation, better prospects and higher profitability will shy away from choosing universal banks as their underwriter to avoid universal banks' monopoly power over their private information.

In addition to the above, I will test the hypothesis that universal banks have already gained sufficient distribution ability and are no longer facing disadvantages when underwriting large corporate debt issuances. Finally, I will test the hypothesis that universal banks still face potential conflict of interest if the issuers possess high amount of debt or if the purpose of the debt issuance is to refinance the issuer's bank debts.

Group 2

The second group of testable hypotheses centers on the factors that affect the yield spread at pricing when the debt securities are underwritten by a universal bank or by an investment bank.

This research project will first test the hypothesis that a certification effect is prevalent for both investment banks and universal banks when a lending relationship exists between the firm and the underwriter bank of the firm's debt securities. That is, lending relationship between an underwriter bank and an issuer will reduce the risk of the debt securities as perceived by the investors. However, the prevalence of such a certification effect should be different for investment banks and universal banks due to the differences in their systems of loan pricing as mentioned above.

If investment banks and universal banks are assumed to have similar underwriting technologies, comparison between the coefficients from the regression of both types of

banks can be made. Subsequently, I will further test the certification effect hypothesis by examining if universal bank underwriters can better reduce the perceived risk of debt securities issued by smaller and lesser known firms as well as first time issuers. I will also conduct a further test for the conflict of interest hypothesis mentioned above by verifying if investors perceive more risk in debt securities that universal banks underwrote for issuers with high amount of debt or for issuers looking to refinance their bank debts.

On the other hand, if investment banks and universal banks are assumed to have different underwriting technologies, comparison between the coefficients from the regression of both types of banks is not meaningful. Subsequently, I will test the hypothesis that investment banks and commercial banks both have their respective comparative advantages at serving different clienteles, that is, firms will obtain lower yield spreads from the selected underwriters versus the unselected underwriters. However, I also hypothesize that neither type of bank has absolute advantage in underwriting corporate debt securities, that is, neither type of banks can obtain lower average yield spreads for all debt securities assuming the existence of only one type of bank.

Group 3:

The third group of testable hypotheses centers on the factors that affect the gross spread at pricing when the debt securities is underwritten by a universal bank or by an investment bank. This research project will first examine the data to see if gross spread has also been declining over the years due to increasing competition from universal banks.

If investment banks and universal banks are assumed to have similar mechanism for charging underwriting fees, a further test for the universal bank monopoly power hypothesis can be conducted by examining if smaller and lesser known issuers as well as first time issuers are subjected to monopoly power of underwriter universal banks. Then, I can also test the hypothesis that there is no gross spread difference between investment banks and universal banks underwritten corporate debt issues.

Finally, if investment banks and universal banks have different mechanism for charging underwriting fees, I can further test my hypothesis that neither type of banks can obtain lower average gross spreads for all debt securities, that is, neither type of bank can perform underwriting services at a cheaper fee.

Theoretical Framework

The theoretical framework for the research to test the groups of hypotheses outlined above will be a combination of the models developed by previous literatures, with some modifications.

Model 1

The first model will focus on the factors that determine the choice between universal bank and investment bank as debt security underwriter for a particular firm with certain set of characteristics. A maximum likelihood estimation using a logit regression can be used for this purpose.

$$\max_{\beta_0, \beta_1 ... \beta_j} L_i = \sum_{i=1}^{n} \ln\left(\frac{1}{1 + e^{-(y_i - \beta_0 - \beta_1 x_{i1} ... - \beta_j x_{ij})}} \right)$$

where y_i is the kind of bank underwriter for bond i; there are j number of x_i, which are independent variables or characteristics of the issuer and bond i; n is the number of observations or the number of bond issuances.

The independent variables for this model, their probable influence on the choice of underwriter and their sources are listed in Table 2 of research methodology section. In addition, some of the key variables for testing the hypotheses in Group one using this model will be discussed in details in the same section.

Model 2

The second model will focus on the variables that influence the yield spreads at pricing when debt securities are done by universal banks and investment banks. This model consists of second-stage yield spread regressions with endogenous selectivity bias adjustment terms from the Heckman selection model. The yield spread regression is first estimated using the combined dataset. Then, separate yield spread regressions can be estimated for universal banks and for investment banks. Finally, a Chow Test can be conducted to see if investment banks and universal banks have different underwriting technologies and as a result, require two separate regressions to account for the differences in their underwriting technologies. This analysis assumes that issuers select the underwriter type that produces lower financing costs for their bond issuances.

The selectivity bias adjustment terms are estimated using the first stage logit regression on the underwriter choices in Model 1. This adjustment is needed because the independent distribution of firms over the type of underwriter bank is not random. Issuers that chose universal banks over investment bank might have some observable and

unobservable characteristics that are different from issuers that chose investment banks. If such characteristics are positively related to yield spreads, then a simply running a regression of choice of underwriter on yield spreads will yield biased estimates. This is evident from the fact that bank information is private and cannot be adequately proxied by publicly observable variables. For example, if the market believes that investment banks have better underwriting technologies due to their established experiences in the business, such a belief will manifest itself as lower yield spreads of bonds conditional on investment bank underwriting.

There are two alternatives for the second-stage yield spread regressions with endogenous selectivity bias adjustment terms as discussed above. A singleyield spread regression with endogenous selectivity bias adjustments can be done, assuming that both investment banks and universal banks have similar underwriting technologies:

$$E(y_i \mid I_i = 1) = \beta_o + \sum_{j=1}^{n} \beta_j x_{ij+1} + \sigma_\varepsilon \frac{\phi(Z\gamma)}{\Phi(Z\gamma)}$$

$$E(y_i \mid I_i = 0) = \beta_o + \sum_{j=1}^{n} \beta_j x_{ij+1} - \sigma_\varepsilon \frac{\phi(Z\gamma)}{1 - \Phi(Z\gamma)}$$

where y_i is yield spread in basis points for bond i; x_{ij} are independent variables for bond i with characteristic j (the additional variable in the single regression is the underwriter type); I_i is a dummy variable taking the value 1 if firm chooses a commercial bank as its underwriter and 0 otherwise; ξ is the random term of the selection process (logit regression); $\varphi(.)$ and $\Phi(.)$ are, respectively, the standard normal density and distribution functions; $Z\gamma$ is vector of all exogenous firm or issue characteristics.

The other alternative is to estimate two yield spread regressions with endogenous selectivity bias adjustments, assuming that both investment banks and universal banks have different underwriting technologies:

$$E(y_{1i} \mid I_i = 1) = \alpha_{1o} + \sum_{j=1}^{n} \alpha_{1j} x_{ij} + \sigma_{1\varepsilon} \frac{\phi(Z\gamma)}{\Phi(Z\gamma)}$$

$$E(y_{2i} \mid I_i = 0) = \beta_{2o} + \sum_{j=1}^{n} \beta_{2j} x_{ij} - \sigma_{2\varepsilon} \frac{\phi(Z\gamma)}{1 - \Phi(Z\gamma)}$$

where subscript 1 refers to universal bank underwritten debt securities and subscript 2 refers to investment bank underwritten debt securities.

The independent variables for this model, their projected impacts on yield spreads and their sources are listed in Table 3 of research methodology section. In addition, some of the key variables for testing the hypotheses in Group two using this model will be further discussed in the same section.

Model 3

The third model will focus on the variables that influence the gross spreads at pricing when debt securities are done by universal banks and investment banks. This model is similar to Model 2. It consists of estimating a single gross spread regression for the combined dataset and also two separate gross spread regressions, one for universal banks and another for investment banks. A Chow Test can then be conducted to see if investment banks and universal banks have different mechanism for charging their clients for underwriting fees, and as a result, require two separate regressions to account for such differences. This analysis assumes that issuers select the underwriter type that produces lower financing costs for their bond issuances.

These second-stage gross spread regressions also incorporate endogenous selectivity bias adjustment terms from the Heckman selection model and can be obtained from logit regression in Model 1. As discussed above, there are again two possibilities for the second-stage gross spread regression. A single gross spread regression with endogenous selectivity bias adjustment can be done, assuming that the mechanisms for charging the issuers are similar for both universal banks and investment banks:

$$E(y_i \mid I_i = 1) = \beta_o + \sum_{j=1}^{n} \beta_j x_{ij+1} + \sigma_\varepsilon \frac{\phi(Z\gamma)}{\Phi(Z\gamma)}$$

$$E(y_i \mid I_i = 0) = \beta_o + \sum_{j=1}^{n} \beta_j x_{ij+1} - \sigma_\varepsilon \frac{\phi(Z\gamma)}{1 - \Phi(Z\gamma)}$$

where y_i is gross spread in basis points for bond i; x_{ij} are independent variables for bond i with characteristic j (the additional variable in the single regression is the underwriter type); I_i is a dummy variable taking the value 1 if firm chooses a commercial bank as its underwriter and 0 otherwise; ξ is the random term of the selection process (logit regression); $\varphi(.)$ and $\Phi(.)$ are, respectively, the standard normal density and distribution functions; $Z\gamma$ is vector of all exogenous firm or issue characteristics.

The alternative is to estimate two gross spread regressions with endogenous selectivity bias adjustments, assuming that the mechanism for calculating underwriting fees for universal banks are significantly different from that for investment banks:

$$E(y_{1i} \mid I_i = 1) = \alpha_{1o} + \sum_{j=1}^{n} \alpha_{1j} x_{ij} + \sigma_{1\varepsilon} \frac{\phi(Z\gamma)}{1 - \Phi(Z\gamma)}$$

$$E(y_{2i} \mid I_i = 0) = \beta_{2o} + \sum_{j=1}^{n} \beta_{2j} x_{ij} - \sigma_{2\varepsilon} \frac{\phi(Z\gamma)}{\Phi(Z\gamma)}$$

where subscript 1 refers to universal bank underwritten debt securities and subscript 2 refers to investment bank underwritten debt securities.

The independent variables for this model, their possible influence on gross spreads and their sources are listed in Table 4 of research methodology section. In addition, some of the key variables for testing the hypotheses in Group three using this model will be discussed in details in the same section.

Research Methodology:

Data Collection

In order to carry out this research, the sample needs to consist of both universal bank and investment bank underwritings, meaning that the sample should begin no earlier than November 12, 1999 when GLBA was enacted. The date officially terminated all barriers preventing commercial banks from full involvement in corporate securities underwriting, thereby signifying the official status and establishment of universal banks. In addition, I believe this date marks significant passage of time since commercial banks were initially allowed to underwrite corporate debt securities in 1989, and, thus, universal banks should no longer face disadvantages in underwriting corporate debt securities. As a result, the sample period is defined as November 13, 1999 to December 29, 2004. December 29, 2004 is used as the end date because that is the latest date for which data is available.

The corporate debt issuance data for this research consisted of fixed-rate nonconvertible domestic debt issuance obtained from the SDC Platinum U.S. Corporate New Issues database offered by Thomson Financial. Only non-financial and non-utility

firms are used in the analysis due to the fact that these types of firms are subjected to relatively heavier regulations. In addition, the nature of any conflict of interest among financial firms may be significantly different from that between non-financial firms and their underwriters. In addition, any observation that does not specify the lead underwriter, the yield spread or the gross spread is excluded from the dataset.

The information on active U.S. corporate loans during the same time period of November 13, 1999 to December 29, 2004 is obtained from Dealscan provided by the Loan Pricing Corporation. The amount of loan deals is aggregated for each corporate debt issuance if the issuing date is between the loan origination and maturity date. For loans without facility maturity date, only those that are still active or with a facility active date within two years time period from the debt issuance date is aggregated for each corporate debt issuance. I recognize that the settlement date of these loans can vary, but there is no data to verify such information.

The financial information regarding each of the issuer in the dataset is compiled first using Compustat. Where such information is not available, the 10-K fillings of these firms are consulted. Any observation that is still missing such information is excluded from the dataset. Finally, the 3-Year, 5-Year and 10-Year Benchmark Treasury rates are compiled by using Bloomberg database.

The final sample contains 1218 observations and their summary statistics are listed in Table1.

Table1: Summary Statistics of the Sample

Issue Characteristics	Universal Banks		Investment Banks		Full Sample		
	Number	Percentage	Number	Percentage	Number		
1999	1	100.0%	0	0.0%	1		
2000	94	39.5%	144	60.5%	238		
2001	190	56.0%	149	44.0%	339		
2002	165	60.9%	106	39.1%	271		
2003	166	70.6%	69	29.4%	235		
2004	99	73.9%	35	26.1%	134		
Total:	715	58.7%	503	41.3%	1218		
New Issue	39	52.7%	35	47.3%	74		
Shelf-Registered	705	59.2%	485	40.8%	1190		
Non-callable	208	59.4%	142	40.6%	350		
Senior	703	59.3%	482	40.7%	1185		
Refinance bank debts	76	65.5%	40	34.5%	116		
Other Issue Characteristics	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev

Other Issue Characteristics	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
Yield spread (Basis Points)	175.53	155.00	104.20	190.33	162.00	127.81	175.53	158.00	114.72
Gross Spread	0.69	0.63	0.47	0.80	0.63	0.70	0.73	0.63	0.58
Issue Amount (US$ MM)	426.50	300.00	530.06	440.39	300.00	485.52	432.23	300.00	511.98
Lending Relationships									
Ln(Total Loans)	18.59	22.56	8.87	17.59	22.43	9.64	18.18	22.52	9.20
Ln(Underwriter Loans)	14.65	21.51	10.83	14.52	21.63	10.84	14.60	21.53	10.83
Firm Characteristics									
Firm Size (US$ MM)	31,064.71	14,119.50	50,259.17	35,160.81	13,736.22	71,860.26	32,756.28	13,862.00	60,133.95
CashHoldings (US$ MM)	2,272.24	239.00	24,542.29	4,402.07	198.10	36,149.32	3,151.80	215.00	29,891.60
Capital Investment (US$ MM)	18,924.70	8,459.00	29,961.28	19,987.15	8,439.00	36,223.09	19,363.46	8,439.00	32,682.78
Operating Income (US$ MM)	6,513.71	2,064.00	32,345.89	3,805.78	1,731.00	5,858.37	5,395.41	1,868.00	25,095.07
Interest Expense (US$ MM)	557.40	266.09	991.17	847.94	262.16	3,549.91	677.38	264.13	2,407.28
Total Debt (US$ MM)	10,553.42	4,608.91	20,695.97	13,905.76	4,619.00	37,702.24	11,937.85	4,619.00	28,988.90

It is interesting to note the decline of investment banks underwritten issues over the years in the sample. Investment banks' market share dropped significantly from 60 percent to 34.5 percent since 1999. This confirms the prior remark that investment banks are losing foothold in the market that they have dominated for the past century.

Description of Variables

 Given below are three tables with descriptions for all the independent variables,

their probable relationship with the dependent variables and their sources for all three

models discussed in the theoretical framework section. In addition, some key variables

will be discussed in detail.

Table 2: Variables for Model 1 (Logit regression)

Dependent Variable	Description		Source*
BANK	Dummy variable 0=If the lead underwriter is an Investment Bank 1=If the lead underwriter is a Universal Bank If more than one underwriter leads the syndicate, then the first underwriter on the list is used to determine underwriter type		SDC, SB
Independent Variable	**Description**	**Probable influence on choice of underwriter bank****	**Source**
Issue Characteristics			
LnISSUE	Ln(Size of debt securities issuance in US$MM)	No influence Both investment banks and universal banks should have well-established distribution abilities	SDC
INDUSTRY	Six dummy variables constructed based on one digit primary SIC code Base industry: Services INDUSTRY1: Mining INDUSTRY2: Construction INDUSTRY3: Manufacturing INDUSTRY4: Transportation, Communications And Sanitary Services INDUSTRY5: Trade	Different industries might use different type of banks for securities underwriting	SIC
REFBD	Dummy variable 0=Other purposes 1=Purpose of debt securities issuance is for refinancing of universal bank debt	Negative Firm will want to avoid potential concern for conflict of interest	SDC
NEWISSUE	Dummy variable 0=Issuer have no bond issuance within 20 years prior to the current bond issuance 1=New issue	Positive New issuers have higher information asymmetries and they will take advantage of the certification effect provided through universal banks' superior information	SDC

RATING	Seven dummy variables according to Moody's credit ratings Base: NR RATINGAaa: Aaa rating RATINGAa: Aa1 to Aa3 ratings RATINGA: A1 to A3 ratings RATINGBaa: Baa1to Baa3 ratings RATINGBa: Ba1to Ba3 ratings RATINGC: Caa to C ratings	Lower credit rating firm will take advantage of the certification effect provided by universal banks	SDC
Lending relationships			
LnTOTSTAKE	Ln of (one plus existing total bank loans in US$MM)	Negative Higher total bank loans will be perceived by the public as a potential for conflict of interest if a universal bank was to underwrite the debt issuance	DS
Prior securities issuance			
LnPRIORDEB	Ln of (one plus number of bonds issued within the 5-year period prior to the current bond issuance)	Negative Issuer with more debt issuances will have less information asymmetries problem	SDC
Firm Characteristics			
LnFIRMSIZE	Ln(Size of firm measured in total assets)	Negative Smaller issuers have higher information asymmetries and they will take advantage of the certification effect provided through universal banks' superior information	COM
CASHHOLD	Cash holdings/totals assets	Negative Firms with lower cash holdings will take advantage of flexible future financing options provided by universal banks	COM
CAPINV	Capital investment/total assets	Positive Firms with higher capital investment will face more severe financial constraints and will take advantage of flexible future financing options provided by universal banks	COM
INTEXP	Interest expense/operating income	Negative Higher interest expense means higher loans and this will be perceived by the public as a potential for conflict of interest if a universal bank was to underwrite the debt issuance	COM
OPERIN	Operating income/total assets	Negative Higher operating income means better prospects. Firms will want to avoid bank information monopoly that will allow universal banks to expropriate firm's future profits.	COM

TOTDEB	Total debt/total assets	Negative Higher total debt will be perceived by the public as a potential for conflict of interest if a universal bank was to underwrite the debt issuance	COM
Syndicate Type			
COLEDUB	Dummy variable 0=Bond issuance not co-led by universal banks 1=bond issuance is co-led by universal banks	Negative The co-lead underwriter universal banks can provide certification effect and the underwriting technologies	SDC

*SDC denotes Securities Data Corporation offered through Thompson Financials; DS denotes DealScan database; SB denotes Statistics on Banking; COM denotes Compustat

**Positive means a positive correlation between probability in choosing universal bank as underwriter and that variable. Negative means a negative correlation

By using Model 1, I can test the hypothesis that universal banks can provide certification effect due to their superior information. I can examine if smaller firms, firms with lower credit ratings and first time issuers with less information on the market will take advantage of the universal banks' certification effect. The logit regression can reveal if the variable of new issuers (NEWISSUE) and low credit rating (RATINGC) is positively correlated with the probability of choosing universal banks as the underwriters. On the other hand, I can examine if the coefficient on the variable of issuers' asset total (LnFIRMSIZE) is negative.

I can also test the hypothesis that firms with severe financial constraints will choose universal banks as underwriters. This means that issuer's cash holdings (CASHHOLD) should be negatively correlated to the probability of choosing a universal bank as underwriter. On the other hand, issuers with high capital investment (CAPINV) will face more severe constraint and should be more likely to choose universal bank as their underwriters. In addition, I can conduct a preliminary test of the universal banks' monopoly power hypothesis by examining if operating income (OPERIN) and asset total

(LnFIRMSIZE) of an issuer are negatively correlated with the probability for the issuer to choose a universal bank as the underwriter.

Besides, if the size of a debt issuance (LnISSUE) has no correlation with the probability of choosing either type of banks as the underwriter, I can verify the hypothesis that universal banks have already gained sufficient distribution ability. Finally, I can also test the hypothesis that universal banks still face potential conflict of interest when underwriting for issuers with large amount of loans or the intention to refinance bank debts. That is, total active loans (LnSTAKE) of the issuer as well as the purpose of refinancing bank debt (REFBD) will be negatively correlated to the probability of an issuer to choose a universal bank as the underwriter. In addition to the above, interest expense (INTEXP) and total debt (TOTDEB), which provide indications of the level of loans and debts of an issuer, can also capture the effect of potential conflict of interest. Subsequently, I can examine if INTEXP and TOTDEB are also both negatively correlated with the probability of an issuer choosing a universal bank as its underwriter.

Table 3: Variables for Model 2
(Two second-stage yield spread regressions with selectivity bias adjustment for universal banks and investment banks)

Dependent Variable	Description		Source*
BPYS	Basis point yield spread is the premium of the *ex ante* yield spread of a bond over the *ex ante* yield of U.S. Treasury security of similar maturity		SDC
Issue Characteristics			
Independent Variable	**Description**	**Predicted sign of coefficient**	**Source**
BANK *(for single yield spread regression)*	Dummy variable 0=If the lead underwriter is an Investment Bank 1=If the lead underwriter is a Universal Bank	Neutral None of the banks possess superior underwriting technologies	SDC
LnISSUE	Ln(Size of debt securities issuance in US$MM)	Positive Bigger amount of debt securities means higher risk for the issuers and investors**	SDC

INDUSTRY	Six dummy variables constructed based on one digit primary SIC code Base industry: Services INDUSTRY1: Mining INDUSTRY2: Construction INDUSTRY3: Manufacturing INDUSTRY4: Transportation, Communications And Sanitary Services INDUSTRY5: Trade	Different industries will have different yield spread for their debt securities	SIC
REFBD	Dummy variable 0=Other purposes 1=Purpose of debt securities issuance is for refinancing of universal bank debt	*Positive for universal banks* *Potential for conflict of interest* *Neutral for investment banks* *Lack of conflict of interest*	SDC
NEWISSUE	Dummy variable 0=Issuer have no bond issuance within 20 years prior to the current bond issuance 1=New issue	Positive Higher risk for public investors due to the lack of information about the new issuer *Less positive for universal banks* *Possession of superior information and can provide certification effect for first time issuers*	SDC
RATING	Seven dummy variables according to Moody's credit ratings RATINGAaa: Aaa rating RATINGAa: Aa1 to Aa3 ratings RATINGA : A1 to A3 ratings RATINGBaa: Baa1to Baa3 ratings RATINGBa: Ba1to Ba3 ratings RATINGC: Caa to C ratings	Firms with lower credit ratings have higher risk *Universal banks possess superior information and can provide certification effect for issuers with lower credit ratings*	SDC
MATURITY	Dummy variables SMAURITY: Short maturity MMATURITY: Medium maturity LMATURITY: Long maturity	Longer maturity means increasing uncertainty and risk	SDC
SHELF	Dummy variable 0=Non-shelf registered debt 1=Shelf registered debt	Negative Shelf registration in advance means less uncertainty and risk	SDC
NONCALL	Dummy variable 0=Callable debt 1=Non-callable debt	Negative Non-callable feature means less uncertainty and risk	SDC
SENIOR	Dummy variable 0=Non-senior debt 1=Senior debt	Negative Senior debt securities have lower risk	SDC

LnMKTSHR	Ln (Market Share) Market share is calculated by dividing a firm's underwritten debt issuance amount by all debt issuance for a given year	Negative Increase market share of underwriter means higher credibility. As a result, debt securities that they underwrote are perceived to be less risky	SDC
Lending relationships			
LnTOTSTAKE	Ln of (one plus existing total bank loans in US$MM)	Positive Firms with bigger amount of loans have more risk *More positive for universal banks* *Potential for conflict of interest due to higher amount of loans*	DS
LnSTAKEUB	Ln of (one plus amount of loan from the underwriter universal bank to the firm in US$MM)	Negative for underwriting universal bank Underwriter can provide the certification effect and lower the risk of issuers	DS
LnSTAKEIB	Ln of (one plus amount of loan from the underwriter investment bank to the firm in US$MM)	Negative for underwriting investment bank because underwriter can provide the certification effect and lower the risk of issuers	DS
Prior securities issuance			
LnPRIORDEB	Ln of (one plus number of bonds issued within the 5-year period prior to the current bond issuance)	Negative Issuers with prior debt issuances will have more information available and their debt securities will have lower risk	SDC
Firm Characteristics			
LnFIRMSIZE	Ln(Size of firm measured in total assets)	Negative Issuers with less assets are more risky for investors *Less negative for universal banks* *Possession of superior information and can provide certification effect for smaller issuers*	COM
CASHHOLD	Cash holdings/totals assets	Negative Issuers with less cash holdings are more risky for investors	COM
CAPINV	Capital investment/total assets	Negative Issuers with more capital investment are less risky for investors	COM
INTEXP	Interest expense/operating income	Positive Issuers with more interest expense have more debts and are more risky for investors *More positive for universal banks* *Potential for conflict of*	COM

OPERIN	Operating income/total assets	Negative Issuers with higher operating income have less risk	COM
TOTDEBT	Total debt/total assets	Positive Issuers with larger total debts have higher risk *More positive for universal banks* *Potential for conflict of interest due to larger amount of debts*	COM
EXCHANGE	Dummy variable 0=not listed on exchange 1=listed on exchange	Negative Firms listed on exchanges have more information available to public and hence are less risky	SDC
SELECTION	Endogenuous selection term (inverse Mill's ratio) Estimated by using the results of first stage logit estimation	Unknown	N/A
Macroeconomic Environments			
TREASURY	TREASUR3Y TREASURY5Y TREASURY10Y	Positive Higher treasury rate means better fixed income market performance, resulting in higher bond price and bigger yield spread	BLOOM
Syndicate Type			
COLEDUB	Dummy variable 0=Bond issuance not co-led by universal banks 1=bond issuance is co-led by universal banks	Negative The co-lead underwriter universal banks can provide certification effect through superior information	SDC

*SDC denotes Securities Data Corporation offered through Thompson Financials; DS denotes DealScan database; TB denotes Treasury Bulletin; SB denotes Statistics on Banking; COM denotes Compustat; BLOOM denotes Bloomberg
**Lower risk means that investors are willing to pay a higher price for the debt securities and, thus, a lower yield spread. Higher risk means that investors need to be compensated for the additional risk they are taking and, thus, a higher price foir the debt securities or a higher yield

By using Model 2, I can first test if coefficient on the loans extended from the underwriter banks (LnSTAKEUB and LnSTAKEIB) to the issuers is negative to verify the certification effect hypothesis.

If the underwriting technologies for investment banks are found to be similar to that of universal banks, I can make comparison of the coefficients of the regressions. I can further test the above certification effect hypothesis by examining if the prevalence of

the certification effect is different for investment banks and universal banks due to the differences in their systems of loan pricing as mentioned above. That is, I will examine if the coefficients on Ln(STAKEUB) and Ln(STAKEIB) are significantly different from each other. I can also test if smaller and lesser known firms (LnFIRMSIZE) as well as first time issuers (NEWISSUE) can obtain smaller yield spreads from universal bank underwriters if compared to investment bank underwriters. I can also test if a universal bank faces severe price discount for debt securities it underwrote for an issuer with high amount of debts and loans (LnTOTSTAKE, INTEXP and TOTDEBT) or if the purpose of the debt issuance is to refinance the issuer's bank debts (REFBD).

On the other hand, if the underwriting technologies of universal banks and investment banks are found to be different, the model can be used to find the yield spread differentials in basis points between investment banks and universal banks underwriting. The yield spread differentials are the estimated yield spread had the issuers used the unselected underwriters which is not observable empirically minus the observed yield spread when underwritten by the selected underwriters. This estimated yield spreads can be obtained by switching the underwriter coefficients obtained from the above regressions, but holding the firm and issue characteristics constant, but leaving out the selectivity bias adjustment terms. Therefore, a positive yield spread differential means that the issuer for a particular debt security obtains lower yield spread from the selected underwriter than from the unselected underwriter. This is an indication that investment banks and universal banks have comparative advantages in serving different groups of clients.

In addition, we can estimate unconditional mean yield spreads, assuming only one type of underwriter had existed during the sample time period. Subsequently, we can determine if, on average, any one of the bank models can produce lower yield spread for all clients. That is, does any of the bank models possess absolute advantage in underwriting debt security through producing lower yield spread for all clients on average?

Table 4: Variables for Model 3
(Two second-stage gross spread regressions with selectivity bias adjustment for universal banks and investment banks)

Dependent Variable	Description	Source*
GS	Gross spread is the proportion of fees charged by the underwriters. It is calculated by dividing underwriting fees by total proceeds from the offering (includes management fees, underwriting fees and selling concession)	SDC

Issue Characteristics			
Independent Variable	**Description**	**Predicted sign of coefficient**	**Source**
BANK *(for single yield spread regression)*	Dummy variable 0=If the lead underwriter is an Investment Bank 1=If the lead underwriter is a Universal Bank	Neutral None of the bank can underwrite debt securities at lower cost	SDC
LnISSUE	Ln (Size of debt securities issuance in US$MM)	Positive Bigger amount of debt issuance means higher risk for underwriter banks**	SDC
REFBD	Dummy variable 0=Other purposes 1=Purpose of debt securities issuance is for refinancing of universal bank debt	*Negative for universal banks The potential for conflict of interest means lower proceeds to the issuers, thereby compelling universal banks to underwrite the debt securities at lower fees* *Neutral for investment banks Lack of potential for conflict of interest*	SDC
LnMKTSHR	Ln (Market Share) Market share is calculated by dividing a firm's underwritten debt issuance amount by all debt issuance for a given year	Positive Bigger market share means less competition and hence higher underwriting fees	SDC

NEWISSUE	Dummy variable 0=Issuer have no bond issuance within 20 years prior to the current bond issuance 1=New issue	Positive No prior debt issuance means higher risk for underwriter banks *More positive for universal banks* *Universal banks have monopoly power of over private information of new issuers*	SDC
RATING	Seven dummy variables according to Moody's credit ratings RATINGAaa for Aaa rating RATINGAa for Aa1 to Aa3 ratings RATINGA for A1 to A3 ratings RATINGBaa for Baa1to Baa3 ratings RATINGBa for Ba1to Ba3 ratings RATINGC for Caa to C ratings	Lower credit rating firms are riskier for the underwriter banks	SDS
MATURITY	Dummy variables (long, medium and short term maturity)	Positive Longer maturity means higher risk	SDC
SHELF	Dummy variable 0=Non-shelf registered debt 1=Shelf registered debt	Negative Shelf registration in advance means less uncertainty and risk for underwriter banks	SDC
NONCALL	Dummy variable 0=Callable debt 1=Non-callable debt	Negative Non-callable feature has less uncertainty and risk for underwriter banks	SDC
SENIOR	Dummy variable 0=Non-senior debt 1=Senior debt	Negative Senior debt is less risky for underwriter banks	SDC
INDUSTRY	10 dummy variables constructed based on one digit primary SIC code	Each industry will have different gross spreads for underwriter banks	SIC
Lending relationships			
LnTOTSTAKE	Ln (one plus existing total bank loans in US$MM)	*Negative for universal banks* *The potential for conflict of interest means lower proceeds to the issuers, thereby compelling universal banks to underwrite the debt securities at lower fees* *Neutral for investment banks* *Lack of potential for conflict of interest*	DS
LnSTAKEUB	Ln(one plus amount of loan from the underwriter universal bank to the firm in US$MM)	Positive for underwriter universal bank Certification effect enhances higher proceeds and, thus, a higher underwriting fees	DS
LnSTAKEIB	Ln(one plus amount of loan from the underwriter investment bank to the firm in US$MM)	Positive for underwriter investment bank Certification effect enhances higher proceeds and, thus, a higher underwriting fees	DS

Firm Characteristics			
LnFIRMSIZE	Ln(Size of firm measured in total assets)	Negative Issuers with less assets are more risky for underwriter banks *Less negative for universal banks* *Universal banks have monopoly power of over private information of smaller issuers*	COM
CASHHOLD	Cash holdings/totals assets	Negative Issuers with less cash holdings are more risky for underwriter banks	COM
CAPINV	Capital investment/total assets	Negative Issuers with more capital investment are less risky for underwriter banks	COM
INTEXP	Interest expense/operating income	*Negative for universal banks* *The potential for conflict of interest means lower proceeds to the issuers, thereby compelling universal banks to underwrite the debt securities at lower fees* *Neutral for investment banks* *Lack of potential for conflict of interest*	COM
OPERIN	Operating income/total assets	Negative Issuers with less operating income are more risky for underwriter banks	COM
TOTDEB	Total debt/total assets	*Negative for universal banks* *The potential for conflict of interest means lower proceeds to the issuers, thereby compelling universal banks to underwrite the debt securities at lower fees* *Neutral for investment banks* *Lack of potential for conflict of interest*	COM
EXCHANGE	Dummy variable (0=not listed on exchange and 1=listed on exchange)	Negative Listing on exchange means more information available to public and is less risky	SDC
SELECTION	Endogenuous selection term (inverse Mill's ratio) Estimated by using the results of first stage logit estimation	Unknown	N/A
Prior securities issuance			
LnPRIORDEB	Log of (one plus number of bonds issued within the 5-year period prior to the current bond issuance)	Negative Underwriter banks will charge lower fees for frequent issuers who can also switch	SDC

		underwriters more easily	
Other variables			
YEARS	Five dummy variables (for 1999 until 2004)	As the year progresses, gross spread decreases due to tougher competition from universal banks	

*SDC denotes Securities Data Corporation offered through Thompson Financials; DS denotes DealScan database; TB denotes Treasury Bulletin; SB denotes Statistics on Banking; COM denotes Compustat

**While underwriting debt securities for other firms, the underwriter banks take on certain risk at the time of offering due to liquidity and market risk considerations. Higher risk means that underwriter banks need to be compensated with higher fees for them to underwrite the debt securities and, thus, a higher gross spread; lower risk means that underwriter banks are willing to underwrite the debt securities at lower fees and, thus, a lower gross spread

By using Model 3, I can determine if gross spread has been decreasing during the period of time of data collection. That is, I can examine if coefficients for the dummy variables for each increasing year (YEAR) are negative and significant.

If the mechanism for charging underwriting fees are the same at universal banks and investment banks, I can test the universal banks' monopoly power hypothesis by examining if new issuers and issuers who are smaller in size are charged higher fees if they chose universal banks as their underwriter due to monopoly power of these universal banks over their private information. In other words, I will examine if the coefficient on NEWISSUE is more positive for universal bank underwriters than for investment bank underwriters. And I can examine if the coefficient on LN(FIRMSIZE) is less negative for universal bank underwriters than for investment bank underwriters.

On the other hand, if the mechanism for charging underwriting fees is different, I can test if there is any gross spread differential in basis points between investment banks and universal banks underwritten corporate debt issues. The gross spread differentials are the estimated gross spread had the issuers used the unselected underwriters which is not observable empirically minus the observed gross spread when underwritten by the selected underwriters. Therefore, a positive gross spread differential means that the issuer

for a particular debt security obtains lower gross spread from the selected underwriter than from the unselected underwriter. This is an indication that clients choose an underwriter to minimize underwriting fees.

Finally, I can estimate unconditional mean gross spreads, assuming only one type of underwriter had existed during the sample time period. Subsequently, we can determine if, on average, any one of the bank models can perform underwriting services at lower gross spreads. That is, does any of the bank models possess more efficient underwriting technologies that exert lower underwriting fees on average?

Empirical Results:

First Stage: The Selection Process

The result from Model 1, which is the logit regression on the selection process, is summarized in Table 5 below.

Table 5: Logit Regression Result
Dependent Variable: BANK (1 = Universal Banks, 0 = Investment Banks)

Independent Variables	β	S.E.(β)	Wald Statistics[9]	Odd Ratio	Average values assigned to $\overline{FIRM}$	Change	ΔP[10]
LnISSUE	-.033	.064	.269	.967	5.50 (US$ 245MM)	1.24	-0.95%
INDUSTRY1	-.012	.274	.002	.988	0	1	-0.28%
INDUSTRY2	.124	.236	.274	1.132	0	1	2.82%
INDUSTRY3	-.208	.255	.663	.812	0	1	-4.94%
INDUSTRY4	.046	.232	.040	1.047	0	1	1.06%

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[9] The Wald statistic is the square of the t statistic and has a Chi-squared distribution. It is compared to a Wald critical value to get the level of significance.
[10] Change in probability (ΔP) measures the change in probability to choose universal banks as underwriter as a result of a standard deviation increase in one specific variable (1 unit for dummy variables)(while holding all other variable constant at the average value ($\overline{FIRM}$)

INDUSTRY5	-.510*	.268	3.613	.600	0	1	-12.41%
REFBD	.440**	.219	4.050	1.553	0	1	9.48%
NEWISSUE	.059	.284	.044	1.061	0	1	1.36%
RATINGAaa	-.606	.537	1.276	.545	0	1	-14.80%
RATINGAa	-.234	.324	.519	.792	0	1	-5.57%
RATINGA	-.028	.274	.010	.972	0	1	-0.65%
RATINGBaa	.295	.248	1.419	1.344	0	1	6.53%
RATINGB	-.304	.384	.629	.737	0	1	-7.29%
RATINGC	-20.318	19406.806	.000	.000	0	1	-63.52%
LnTOTSTAKE	.012*	.007	3.179	1.013	18.18 (US$ 78MM)	9.20	2.52%
LnPRIORDEB	.045	.079	.328	1.046	1.87 (6 issuances)	1.16	1.20%
LnFIRMSIZE	-.001	.069	.000	.999	9.48 (US$ 13Bn)	1.35	-0.03%
EXCHANGE	.151	.236	.411	1.163	0	1	3.42%
CASHOLD	-.588	.627	.881	.555	0.0435 (US$ 1.0 MM)	0.101	-1.38%
CAPINV	-.396	.544	.531	.673	0.632 (US$ 1.9MM)	0.130	-1.20%
INTEXP	-12.971	9.101	2.031	.000	0.0404 (US$ 1.0 MM)	0.640	-63.48%
OPERIN	1.438	1.052	1.866	4.211	0.361 (US$1.4 MM)	3.45	36.07%
TOTDEB	-.521	.622	.702	.594	0.369 (US$ 1.4 MM)	0.157	-1.91%
COLEDUB	.068	.130	.278	1.071	0	1	1.56%
Constant	.574	.809	.503	1.775	N/A		

* Significant at the 10% level
** Significant at the 5% level

Examining the coefficients on NEWISSUE and LnFIRMSIZE, the signs of these coefficients are consistent with the certification effect hypothesis. That is, decrease in assets and status as a new issuer will increase the probability of choosing a universal bank as the underwriter. However, these coefficients are small and are not significant. On the other hand, the coefficient on RATINGC is negative with large standard error. This is because there is no firm with credit rating of "C" and below that chooses universal bank as the underwriter in the sample, which might not be representative of all debt issuance. Subsequently, the coefficient of this variable is biased and cannot provide conclusive evidence. As a result, there is no evidence from this research that supports the hypothesis that universal banks possess the advantage of superior information and can thus better provide certification effect to smaller and lesser known firms as well as first time issuers.

This result is nonetheless consistent with the fact that most of the firms in the sample are not perceived to possess information asymmetries problem. In fact, 1117 of the 1218 observations in this sample are issuers that are publicly listed companies and are required to provide detailed financial information to regulatory bodies and public investors. This ensures that there is no information asymmetries problem for these debt issuers. In addition, among those companies that are not listed on exchanges and therefore might have information problems, only eight issuers are new issuers that have not issued debt securities for the past 20 years. Subsequently, the issuers with prior debt issuance experience also have less information problem as they were required to provide detailed financial information in prior debt issuances and they also have a proven track record from previous issuances of debt securities.

Therefore, assuming that this sample is representative of all debt issuances, there is no evidence that universal banks possess the advantage of superior information and can therefore compete more effectively against investment banks. This is because of the diffusion of information of these issuers due to their previous equity and debt issuances. Even though universal banks can conceivably obtain private information that is not available publicly through their lending activities, the positive certification effect from such private information is minimal and does not induce the issuers to choose universal banks as the underwriters.

In order to verify the hypothesis that firms with severe financial constraints will choose universal banks as their underwriters to take advantage of flexible future financing options, the coefficients on CASHOLD and CAPINV can be examined. It is found that the signs of these variables contradict each other and are not significant. This result, while provide no evidence to support the hypothesis stated above, is unsurprising because of the fact that investment banks and other financial institutions are also offering other flexible financing options for their clients through syndicated loans and other instruments. The coefficients on OPERIN and LnFIRMSIZE also contradict each other and insignificant and thus cannot provide evidence to support the hypothesis that universal banks can establish monopoly power on private information of firms that cannot signal future profit credibly. This result is again unsurprising because of the little competitive benefits that universal banks can obtain from private information on firms that they possess as discussed above.

Apart from the above, the coefficient on the size of debt issuance (LnISSUE) is found to be insignificant with large standard error. The lack of predictive power of

LnISSUE on the choice of underwriter verifies the fact that issuers looking to issue large amount of debt securities no longer looks to investment banks as their underwriters. This confirms the hypothesis that universal banks are no longer facing constraints in their distribution network. The coefficients on INTEXP and TOTDEB are both negative and as a result are consistent with my hypothesis that higher amount of loans can lead to the issuers' fear of potential conflict of interests. However, since these coefficients are not significant they can not provide conclusive evidence. Besides, INTEXP and TOTDEB measure the levels of both debts and loans of an issuer and as a result, might not be the most ideal variables for verifying the conflict of interest hypothesis.

Finally, the coefficients on both REFBD and LnTOTSTAKE are positive and significant at the five percent and ten percent level. This result indicates that the probability of an issuer choosing a universal bank as its underwriter increase by 9.48 percent if the purpose of the debt issuance is to refinance bank debts. The result also indicates that a standard deviation increase of loans (LnTOTSTAKE) increases the probability of an issuer choosing a universal bank as its underwriter by 2.52 percent. This is contrary to my hypothesis that issuers with high amount of loans and issuers looking to refinance their bank debts will choose investment banks over universal banks as their underwriters because of the fear of potential conflict of interest. This result can be explained by the fact that firms who have large amount of loans have already established close banking relationship with their banks. Using these banks as the underwriters for their debt securities can further strengthen such these relationships and benefit the firms in other aspects. In addition, these banks can also reuse the private information of the

firms that they obtain through previous lending relationship, which will clearly be cost effective for both the firms and the banks.

On the other hand, this result can also be an indication of the possibility of conflict of interest in the practices of the universal banks. This is because these issuers who have large amount of loans or are looking to refinance their bank debts tend to choose universal banks as their underwriters despite the fact that public investors are well aware of the potential for conflict of interest and might demand higher yield for such securities. It is possible that debt underwriting service is easier to obtain from the universal banks due to the well established banking relationships. Such a practice can be detrimental to public investors if the universal banks pass on the risk of non-credit worthy firms to these investors. This issue will be further explored using the result from the yield spread and the gross spread regressions.

Second Stage: The analysis of Yield Spreads and Gross Spreads

A single yield spread regression and a single gross spread regression for the entire sample are initially estimated. Subsequently, separate yield spread and gross spread regressions are estimated for both types of banks. Comparing the coefficients suggests that the relationship between yield spread and other independent variables are not the same in the two sub samples. As a result, Chow test is used to examine if there are indeed structural differences in the two banks' sub samples. The Chow test assumes that the error terms for the sub samples are normally and independently distributed, which are found to be reasonable assumptions for these two sub samples after histograms of their respective residuals were examined. The formula for Chow Test is given as following:

$$F = \frac{(RSS_R - RSS_{UR})/k}{(RSS_{UR})/(n_1 + n_2 - 2k)}$$

where RSS_R is the restricted residual sum of squares as it is obtained by imposing the restrictions that coefficients in the two sub samples are the same; RSS_{UR} is the unrestricted residual sum of squares which is the sum of RSS for both sub samples; k is the number of parameters estimated; n_1 and n_2 are the number of observations in these two sub samples.

The result from the Chow Test, $F_{(40,1138)} = 3.189$, is higher than the critical value, $F_{(40, \infty)\ 0.1\%} = 1.59$, meaning that RSS_R decreased significantly after imposing the restriction. This indicates that a single regression of yield spreads for both sub samples is an inadequate specification and separate regressions must be estimated.

Applying the same test on the gross spread regressions, it is found that the result, $F_{(40,1138)} = 2.206$, is also higher than the critical value, $F_{(40, \infty)\ 0.1\%} = 1.59$, meaning that RSS_R for gross spread regressions also decreased significantly after imposing the restriction. As a result, separate regressions for investment banks and universal banks must be estimated for gross spreads as well.

Two yield spread and two gross spread regressions are subsequently estimated with the selection bias adjustment terms. However, plots of the residual terms against the dependent variables quickly reveal the possible problem of heteroskedasticity in these regressions. Subsequently, the White's General Heteroskedasticity Test is employed to provide a more accurate confirmation of the presence of heteroskedasticity in these regressions. For this test, squared residuals are regressed on the original independent variables, the squared values of non-dummy variables and the cross products of all non-dummy variables. If there is no heteroskedasticity, the following condition will apply:

$$n \cdot R^2 \underset{asy}{\sim} \chi^2_{df}$$

where n is the sample size; R^2 is obtained from the auxiliary regression; χ^2 is the chi-square distribution and df is the number of regressors excluding the constant term. That is, the product of n and R^2 should asymptotically follow the chi-square distribution with certain df. The result and conclusion from the White's General Heteroskedasticity Test is summarized in Table 6.

Table 6: Result and Conclusion from White's General Heteroskedasticity Test

Regression:	n	R^2	$n.R^2$	df	$\chi^2_{df}(0.1\%)$ [11]	Heteroskedasticity
Yield spreads regression for investment banks	503	0.355	178.565	144	$Pr(Z \geq 1.96) = 0.025$	Present
Yield spreads regression for universal banks	715	0.545	389.675	157	$Pr(Z \geq 10.2) < 0.001$	Not present
Gross spreads regression for investment banks	503	0.680	342.04	123	$Pr(Z \geq 10.5) < 0.001$	Not present
Gross spreads regression for investment banks	715	0.290	207.35	130	$Pr(Z \geq 4.3) < 0.001$	Not present

Subsequently, the problem of heteroskedasticity in the yield spread regression on investment banks' sub sample was adjusted by using the weighted least square method. The result for both yield spread regressions are presented in Table 7.

Table 7: Yield Spread Regressions Result
Dependent Variable: BPYS (Yield Spreads in Basis Points)

Independent Variables	Universal Banks		Investment Banks	
	Coefficients	Standard Error	Coefficients	Standard Error
(Constant)	524.06***	161.93	682.09***	170.22
LnISSUE	-1.40	4.61	4.57	4.54
INDUSTRY1	8.47	12.08	-14.17	15.45
INDUSTRY2	-6.93	16.93	8.03	14.59

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[11] Since df is greater than 100, the χ^2 values are calculated using the expression $\sqrt{2\chi^2} - \sqrt{(2k-1)} = Z$ where k is the degree of freedom and Z is the standardized normal distribution

INDUSTRY3	12.32	24.65	-17.36	15.10
INDUSTRY4	9.84	11.53	-1.38	12.94
INDUSTRY5	27.59	58.65	2.20	25.06
REFBD	10.59	50.53	94.94*	51.06
NEWISSUE	-15.42	14.88	-19.58	15.88
RATINGAaa	-74.40	104.17	-254.73**	81.81
RATINGAa	-50.56	58.82	-164.73**	74.88
RATINGA	-38.06	35.61	-150.37**	73.52
RATINGBaa	-20.18	40.25	-79.73	74.95
RATINGBa	113.62***	34.23	13.18	74.72
RATINGB	257.94***	75.29	82.01	78.87
RATINGC	-	-	34.55	124.61
SMATURITY	8.24	5.98	9.26	82.95
MMATURITY	28.88***	6.64	20.99	82.97
LMATURITY	30.87***	8.27	30.09	83.11
SHELF	-67.32**	22.58	-46.11**	23.33
NONCALL	8.10	6.95	10.55	9.36
SENIOR	-65.98**	23.03	-22.83	25.39
LnMKTSHR	2.74	1.98	3.74	3.92
LnTOTSTAKE	-0.347	1.48	0.758	0.752
LnSTAKEIB / LnSTAKEUB	-0.385	0.438	-0.642	0.470
REFBDLnSTAKEIB / REFBDLnSTAKEUB	-0.242	0.838	1.11	1.35
LnPRIORDEB	-4.89	6.23	-6.33	4.77
LnFIRMSIZE	-2.62	3.12	-16.44***	4.09
CASHOLD	114.83	78.17	71.06	45.65
CAPINV	-51.42	49.25	-159.03***	37.15
INTEXP	1293.29	1504.84	-10.90	9.12
OPERIN	-317.02*	167.90	-352.65***	92.86
TOTDEB	63.37	68.11	81.28	54.45

REFBDTOTDEB	-39.36	48.86	-204.75*	110.25
EXCHANGE	-28.56	20.61	-2.44	13.14
COLEDUB	-9.89	9.26	8.05	8.03
TREASURY3Y	-15.75	28.31	-25.50	31.32
TREASURY5Y	49.57	60.34	32.26	65.62
TREASURY10Y	-45.67	41.07	4.69	45.52
Selection Bias Adjustment Term (LAMBDA)	-87.35	305.71	164.47	107.41
R Square	0.588		0.644	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Since investment banks and universal banks are found to have different underwriting technologies and such different technologies need to be described using two separate models, comparison of the coefficients is not meaningful. Nonetheless, the sign of the coefficients that are significant are mostly consistent with my hypothesis. RATINGAaa, RATINGAa, RATINGA, SHELF, LnFIRMSIZE, CAPINV and OPERIN are found to have negative impact on yield spreads for investment banks, while SHELF and SENIOR are found to have negative impact on yield spreads for universal banks. This is because these characteristics reduce perceived risk in the debt securities. RATINGBa, RATINGB, MMATURITY and LMAURITY are found to positively impact yield spreads for universal banks because lower rating and longer maturity increases the perceived risk of the debt securities.

On the other hand, REFBD is found to have negative impact yield spreads for investment banks. This is in contradiction to my hypothesis that investment banks are immune from potential conflict of interest. There are two possible explanations for this finding. First, the entry of investment banks into the commercial lending business has

also rendered them susceptible to the potential for conflict of interest. On the other hand, it is also possible that public investors regard all issuances for refinancing bank debts as risky. Finally, the finding that the interaction term of REFBDTOTDEB has negative impact on yield spreads for investment banks is also in stark contradiction to my hypothesis. It is nonetheless possible that firms with larger amount of debts are highly versatile in handling debt financing and have better track record of repaying their debts. As a result, refinancing bank debts for these firms are perceived to be less risky by public investors. In addition, there is no correlation between treasury yields and yield spread at the pricing of the debt instruments. This is possibly because treasury yields reflect demand in the secondary market and investors are generally more concern about the fundamentals of the issuers in the primary market.

Finally, the estimates of the selectivity bias adjustment terms (LAMBDA) for investment banks is negative, indicating that yield spread is lower conditional on selecting investment banks as underwriters. Even though the estimates are insignificant, the fact that the selectivity term on investment banks is positive and the selectivity term on universal banks is negative indicates "an efficient client distribution as firms appear to be sorting based on the endogenous comparative ad vantages of underwriters". (Song, 2003)

Since comparison of coefficients is not meaningful, the yield spread differentials in basis points between investment banks and universal banks underwriting are estimated. In addition, unconditional mean yield spreads, assuming only one type of underwriter had existed during the sample time period is also estimated. The result from the yield spread differentials and unconditional mean yield spreads estimation is reported in Table 8.

Table 8: Result of the Estimation of Yield Spread Differentials and Unconditional Mean Yield Spreads

If issuers had chosen investment banks		If issuers had chosen Universal banks	
Mean Yield Spread Differentials	*t*-test	Mean Yield Spread Differentials	*t*-test
23.62	7.52***	-21.35	-0.40
Assuming only investment banks had existed		Assuming only universal banks had existed	
Unconditional Mean Yield Spreads	*t*-test	Unconditional Mean Yield Spreads	*t*-test
257.22	21.66***	172.73	-0.37

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

The result from the yield spread differentials, while not significant for universal banks due to the significant variations in the estimated yield spreads, is significant for investment banks. Subsequently, the result gives rough indications of relative performance of underwriting technologies for universal banks and investment banks. The result indicates that clients of universal banks would have obtained a higher yield spread or lower price if they had chosen investment banks as the underwriters. On the other hand, clients of investment banks would have obtained a lower yield spread or higher price if they had chosen investment banks as the underwriters. This means that investment banks do not have comparative advantage in serving some or all of their clients.

In addition, the result from unconditional mean yield spreads also provides similar conclusion. On average, if only investment banks had existed during the time period, the mean yield spread would be 76 basis points higher than the actual mean yield spread. On the other hand, if only universal banks had existed during the time period, the mean yield spread would be 9 basis points lower than the actual mean yield spread, but this result is

not significant. Nonetheless, this result further indicates that investment banks do not have an absolute advantage in serving all clients. In fact, universal banks are possibly the underwriters with the absolute advantage in corporate debt securities underwriting.

This result contradicts my hypothesis and empirical result from previous study which finds that investment banks and universal banks have comparative advantages in serving different group of clienteles. (Song, 2003) However, I believe that this result is consistent with the current situation in the corporate debt securities underwriting business. As mentioned before, investment banks have been steadily losing market share in the corporate debt securities underwriting market since 1999. If investment banks had comparative advantage in serving some clienteles as the study claims from examining debt issuances data between 1990 and 2000, they would not have suffered such a substantial loss in market share.

Subsequently, the gross spread regressions are estimated with selection bias adjustment terms. The result from the gross spread regressions for both banks is presented in Table 9.

Table 9: Gross Spread Regressions Result

Dependent Variable: GS (Gross Spread)

Independent Variables	Universal Banks		Investment Banks	
	Coefficients	Standard Error	Coefficients	Standard Error
(Constant)	0.722	0.818	3.838***	1.03
LnISSUE	-0.009	0.023	-0.021	0.029
INDUSTRY1	-0.090	0.059	-0.045	0.100
INDUSTRY2	-0.068	0.083	0.199**	0.094
INDUSTRY3	-0.081	0.120	0.152	0.097
INDUSTRY4	-0.040	0.056	0.046	0.084
INDUSTRY5	-0.211	0.286	-0.031	0.161

REFBD	-0.154	0.248	0.387	0.325
NEWISSUE	-0.005	0.073	0.126	0.103
RATINGAaa	-0.224	0.508	-2.14***	0.521
RATINGAa	-0.158	0.288	-1.953***	0.478
RATINGA	-0.068	0.174	-1.952***	0.470
RATINGBaa	0.109	0.205	-1.745***	0.481
RATINGBa	0.209	0.167	-1.200**	0.477
RATINGB	1.288***	0.366	-1.011**	0.502
RATINGC	-	-	-1.206	0.802
SMATURITY	0.324	0.054	-0.572	0.529
MMATURITY	0.144***	0.032	-0.428	0.530
LMATURITY	0.478***	0.040	0.025	0.531
SHELF	0.213*	0.110	0.085	0.149
NONCALL	-0.116***	0.034	-0.100*	0.060
SENIOR	-0.226**	0.110	-0.145	0.161
LnMKTSHR	0.006	0.010	0.011	0.025
LnTOTSTAKE	0.007	0.007	0.008*	0.005
LnSTAKEIB / LnSTAKEUB	-0.006***	0.002	-0.008**	0.003
REFBDLnSTAKEIB / REFBDLnSTAKEUB	0.004	0.004	0.010	0.009
LnPRIORDEB	0.002	0.030	-0.019	0.031
LnFIRMSIZE	-0.038**	0.015	0.004	0.026
CASHOLD	0.437	0.380	-0.407	0.290
CAPINV	-0.179	0.241	-0.386	0.237
INTEXP	1.247	7.362	-0.036	0.058
OPERIN	0.270	0.819	-0.249	0.597
TOTDEB	-0.521	0.332	0.457	0.346
REFBDTOTDEB	0.468**	0.235	-0.790	0.703
EXCHANGE	0.028	0.101	0.102	0.084
COLEDUB	-0.052	0.045	-0.008	0.052

YEAR00	0.161	.346	-0.076	0.058
YEAR01	0.190	.345	0.087	0.062
YEAR02	0.190	.345	0.042	0.062
YEAR03	0.184	.346	0.061	0.071
YEAR04	0.170	.346	0.094	0.099
Selection Bias Adjustment Term (LAMBDA)	0.487	1.487	0.886	0.688

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Since investment banks and universal banks are found to have different mechanism for charging underwriting fees and such differences need to be described using two separate models, comparison of the coefficients is not meaningful. Nonetheless, the sign of the coefficients that are significant are mostly consistent with my hypothesis. Higher credit ratings are found to have more negative impact on gross spreads for investment banks (RATINGAaa, RATINGAa, RATINGA, RATINGBaa, RATINGBa RATINGB and RATINGC). This is because firms with higher credit ratings are less risky for the underwriting banks and as a result, the banks do not need to be compensated with higher underwriting fees. The coefficient for RATINGB for universal bank is considerably more positive than the coefficients for other higher credit ratings and it is significant. It is possible that this is an indication of monopoly power of universal banks over private information of firms with lower credit rating because these issuers are charged significantly higher underwriting fees if compared to other issuers with higher rating. However, this is not a conclusive evidence because the lack of comparable coefficient makes it hard to test for the significance of the increase in this coefficient.

In addition, longer maturity (MMATURITY and LMATURITY) is found to have significant positive relationship with gross spread for universal banks. This is because

these characteristics decrease the risk for underwriting banks. On the other hand, non-callable (NONCALL) feature, senior (SENIOR) feature and assets of the issuer (LnFIRMSIZE) have a negative impact on gross spread because these characteristics decrease the risk that the bank has to undertake while underwriting these securities. On the other hand, shelf-registration (SHELF) is found to have positive impact on gross yield for universal banks. It is possible that additional process is required for shelf-registration, resulting in a higher underwriting fee if such registration is done.

Apart from the above, increasing total bank loans (LnTOTSTAKE) increases gross spread for investment banks because of the additional risk from a highly leveraged issuer. However, it is interesting to note that for both investment banks and universal banks, increasing loans from the underwriter significant decreases the underwriting fees. While this is consistent with my initial hypothesis that loans from underwriter can provide the certification effect and lower the risk of issuers, thereby increasing the proceed from the debt offering and the gross spread, the previous discussions regarding establishment of banking relationship and possible conflict of interest should also be taken into consideration. In fact, it is highly possible that both investment banks and universal banks are charging lower fees for underwriting debt securities if the issuer has an existing or potential lending relationship with the bank. This is yet another faucet of the conflict of interest argument against the entry of commercial banks into investment banking activities. This is because universal banks can use their lending relationship to win businesses even if they cannot obtain the best outcome for the issuer. This might not an efficient market outcome and can be detrimental to the interest of the public investors or the market as a whole.

Finally, the estimates of the selectivity bias adjustment terms (LAMBDA) for both universal banks and investment banks are positive, indicating that gross spread is higher conditional on selecting either banks as underwriters. Even though the estimates are insignificant, the fact that both of the selectivity terms are positive indicates a possible inefficiency in the clients distribution. This can explain in part the reasons for the movement of clients from investment banks to universal banks as manifested in the decreasing number of issuances underwritten by investment banks.

Since comparison of coefficients between universal banks and investment banks is again not meaningful, the gross spread differentials between investment banks and universal banks underwriting are estimated. In addition, unconditional mean gross spreads, assuming only one type of underwriter had existed during the sample time period is also estimated. The result from the gross spread differentials and unconditional mean gross spreads estimation is reported in Table 10.

Table 10: Result of the Estimation of Gross Spread Differentials and Unconditional Mean Gross Spreads

If issuers had chosen investment banks		If issuers had chosen Universal banks	
Mean Gross Spread Differentials	*t*-test	Mean Gross Spread Differentials	*t*-test
0.684	38.54***	-0.128	-2.06**
Assuming only investment banks had existed		Assuming only universal banks had existed	
Unconditional Mean Gross Spreads	*t*-test	Unconditional Mean Gross Spreads	*t*-test
1.59	34.7***	0.347	-7.16***

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

The result from the gross spread differentials makes possible the comparison between underwriting fee structures of universal banks and investment banks. Such a comparison shows that clients of universal banks would have obtained a higher gross spread or more expensive underwriting fees if they had chosen investment banks as the underwriters. On the other hand, clients of investment banks would have obtained a lower gross spread or cheaper underwriting fees if they had chosen universal banks as the underwriters. This means that investment banks' internal fee pricing structure dictates a higher underwriting fee than the universal banks.

In addition, the result from unconditional mean gross spreads also provides similar conclusion. On average, if only investment banks had existed during the time period, the mean gross spread would be 0.85 percent higher than the actual mean gross spread. On the other hand, if only universal banks had existed during the time period, the mean gross spread would be 0.38 percent lower than the actual mean gross spread. This result further illustrates the cost effectiveness of the universal banks that add to its competitive advantage in the debt securities underwriting business. This result also contradicts my hypothesis that neither investment banks nor universal banks have the advantage of cheaper cost of underwriting and, thus, neither type of banks can offer underwriting services at a cheaper fee. I believe that this result is again consistent with the current environment of the corporate debt securities underwriting business. Universal banks' cheaper underwriting fee possibly due to their cheaper cost of funds is clearly rendering them an advantage while competing in the business.

The result of this research project illustrates the advantages of deregulation and subsequent entry of universal banks into the corporate debt securities underwriting

business. It is evident that a lower yield spread as a result of the different underwriting technologies of universal banks benefits the issuers who can raise capital at a lower cost. In addition, universal banks' ability to provide underwriting services at lower fees is also a clear benefit for the issuers. These competitive advantages helped universal banks to compete effectively against investment banks. The argument that investment banks and universal banks have comparative advantages in serving different clienteles is unconvincing currently due to the fact that investment banks have been losing market share consistently over the last few years. In addition, the entry of investment banks into commercial lending activities reduces the distinction between investment banks and universal banks, thereby further diminishing the comparative advantages that both of the banks possess. Finally, the entry of universal banks also brings up the issue of conflict of interest due to established banking relationships. Apart from possibly swaying issuers from market efficient outcome, such relationships might also cause the passing on of risk from underwriter banks to public investors.

Critiques and Suggestions for Further Research:

Critiques:

The part of this research project that is most challenging is the ambiguity in the determination of amount of loans, debts and other financial information for issuers of debt securities. This is especially true if the firm was involved in merger or acquisition before the debt issuance. It is unclear if the public take into account the debts and loans from the merging parties. This is further complicated by the lack of specific dates on loan settlement by these firms before the maturity date. In addition, some of the debt issuers

are subsidiaries of other parent companies. It is again unclear if the public perceive the subsidiaries as separate companies or as part of the parent companies. This is because some of the subsidiaries are at the core of the operations of the parent company and the financial information of the entire firm needs to be taken into account. On the other hand, some subsidiaries might not be part of the important operation of the parent company, and in such cases, their separate financial information is usually not available.

Data collection is further complicated by the fact that most of the underwriter banks in the sample have undergone mergers. Subsequently, loans and debts extended by these banks prior to merger need to be taken into account as well. Since extensive research into the history of each individual bank and firm was not done due to time constraints, some debts and loans might not be taken into account. I believe such ambiguity in the determination of amount of loans and debts as well as other financial information contribute in part to the lack of conclusive results in some of the regressions.

In addition to the above, there is also the problem of lack of information regarding small, private firms. As a result, these observations are generally excluded from the database. This can potentially cause sample selection problem where only publicly listed companies with more information available were chosen for the analysis. In addition, another problem with my research is the attempt to address too many issues at one time. This led to inclusion of too many variables in my model. The variables were initially compiled from previous studies and additional variables were added on from other observation. Such a large number of variables does not provide the research with a clear sense of direction. In addition, large amount of data might also lead to data mining.

Suggestions for Further Research:

Judging from the lack of information on private firms, I suggest for further research to be done using only publicly held companies. The limitation on this is that the result cannot be generalized to all companies. However, the financial information for these companies will be readily available and can lead to more conclusive results. In addition, the change of prices in the stock market, which reflects the investors' general perception regarding the company, can be used to explain part of the variation in the pricing of debt securities.

Another avenue for research is to further explore the issue of "banking relationship". Further research can be done to examine if such relationships truly exist and can be captured using observable variables. The research can also address if such relationships cause inefficient outcome and can be detrimental to the interests of other parties. Through such a research, we can reach a definite conclusion regarding "the notion of "banking relationships" as a source of conflict of interest.

Further research can also be conducted in markets other than corporate debt securities. For example, the first day performance of equity issuance can be used to gauge the underwriting technologies of universal banks and investment banks. Research in other markets can further verify the possibility of coexistence of universal banks and investment banks in the future.

In addition, further research regarding the special form of autocorrelation that might be present in data like debt securities issuances can also be done. This form of autocorrelation is different because of the non-regular interval between debt issuances.

Finally, further research can also be conducted regarding the amount of financial innovation from these two kinds of banks. While the additional competition from universal banks can help to lower the underwriting fees, the lack of profit can also discourage financial engineering and innovation which can be detrimental to the interest of firms and investors as well as the financial soundness of the market.

Conclusion:

The result of this research indicates the universal banks as the banking structures that possess different underwriting technologies, which can result in lower yield spread as well as lower underwriting cost. As a result, the investment banks can be seen as lacking competitive advantage in the corporate debt securities underwriting market. However, the entry of investment banks into the commercial lending business is one of the many steps that they are taking in order to preserve their foothold in the business. The positive effect from such a move is not yet visible, but these commercial lending businesses are growing rapidly. As a result, I believe that coexistence of investment banks and universal banks in the future is likely, but the distinction between investment banks and universal banks will no longer be as clear as before. While benefits of universal banks' entry into the corporate debt securities underwriting business are undeniable, the result from this research also finds evidence of potential for conflict of interest due to establishment of banking relationships. The regulatory body should look into this issue and implement necessary precautions and firewalls against such problems to avoid any cost to the public investors as well as the financial market.

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Appendix A:
Given below is the classification of different underwriters[12] in my dataset into investment banks and universal banks using information from LexiNexis Academic as well as supplement information from their respective websites.

Investment Banks	Universal Banks
Bear Stearns & Co Inc	ABN AMRO Incorporated
Countrywide Securities Corp	ABN-AMRO Holding NV
CS First Boston Corp[13]	AIG Inc
Donaldson Lufkin & Jenrette[2]	Banc of America Securities LLC
Goldman Sachs & Co	Banc One Capital Markets, Inc.[14]
Legg Mason Wood Walker	Barclays Capital
Lehman Brothers	BNP Paribas SA
Loop Capital Markets	BNY Capital Markets Inc
Merrill Lynch & Co Inc	Chase Securities Inc[15]
Morgan Keegan Inc	CIBC World Markets Inc
Morgan Stanley	Citigroup
Morgan Stanley Dean Witter	Commerzbank Capital Markets
PaineWebber[16]	Deutsche Banc Alex Brown
Piper Jaffray Cos[17]	Deutsche Bank AG (London)
Prudential Securities Inc	Deutsche Bank Securities Corp
Robertson Stephens & Co	First Union Capital Markets[18]
TD Securities Inc	HSBC Securities Inc
Tokyo-Mitsubishi Securities Co[19]	JP Morgan Securities[4]
Utendahl Capital Partners	Nikko Salomon Smith Barney
Warburg Dillon Read Inc	RBC Capital Markets
Williams Capital Group LP	Royal Bank of Canada
WR Hambrecht & Co LLC	Salomon Smith Barney
	Scotia Capital Markets
	SunTrust Equitable Securities
	SunTrust Securities, Inc.
	Tokyo-Mitsubishi International
	UBS Investment Bank[5]
	UBS Warburg[5]
	US Bancorp Piper Jaffray[6]
	Wachovia Bank NA[7]
	Wachovia Capital Markets[7]
	Wachovia Securities Inc[6]

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[12] The underwriters can include different subsidiaries of the same holding company.

[13] In August of 2000, Credit Suisse Group bought Donaldson Lufkin & Jenrette from AXA Financial Inc.

[14] Bank One is part of the new JPMorgan Chase created on July 1, 2004 upon completion of the holding company merger between JPMorgan Chase & Co. and Bank One Corporation.

[15] The Chase Manhattan Corporation and J.P. Morgan & Co. Incorporated merged in September of 2000

[16] UBS completed financing of the acquisition of PaineWebber in January of 2001.

[17] On December 31, 2003, Piper Jaffray became an independent, publicly held company following its spin-off from U.S. Bancorp.

[18] Wachovia Bank was formed by the 2001 merger of First Union Corp and the former Wachovia Corp.

[19] In September 2002, Kokusai Securities, Tokyo-Mitsubishi Securities, Tokyo-Mitsubishi Personal Securities and Issei Securities merged to create Mitsubishi Securities.