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"Banks in Capital Markets"

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BANKS IN CAPITAL MARKETS

by

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Abstract

Banks are an important source of funding in economies all around the world, making it vital to understand how banks directly and indirectly affect funding through capital markets. Few issues have perhaps been as controversial as the appropriate scope of bank activities and whether banks should participate directly in capital market activities, providing both lending and other services, such as underwriting. We review the arguments and theoretical models that consider the consequences of commercial banks engaging in investment banking activities, and we examine the empirical evidence on the potential for conflicts of interest, which focuses on the pricing and long run performance of debt and equity underwritten securities, both in the United States and internationally. A related topic is whether investment banks and commercial banks can co-exist as underwriters. We summarize the theoretical and empirical literature, focusing on the effect that bank lending has had on underwriter fees and the ability of banks to win underwriting mandates, as well as how investment banks have adapted to commercial bank entry into investment banking. We also consider the indirect role of commercial banks in capital markets, providing a summary of banks' ability to signal the quality of borrowers through their decisions to originate and sell loans. Finally we examine related topics, such as the effects of banks holding equity and engaging in venture capital activities, and we suggest research directions.

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1. Introduction

Banks are an important source of funding in economies around the world. Through syndicated loans arranged by commercial banks, industrial firms borrowed 1.4 trillion dollars in 2003 and 13.2 trillion dollars between 1993 and 2003.[1] The public capital markets have also proved to be a very important funding source. Between 1993 and 2003, industrial firms issued 10.2 trillion dollars of public debt and 2.3 trillion dollars of common stock.[2] Nearly 40 percent of equity issuance and 20 percent of debt issuance occurred the in the United States. These facts raise an important question –how do banks directly and indirectly affect funding through capital markets?

Few regulatory issues have been as controversial as the appropriate scope of bank activities. Should banks participate directly in capital markets, providing not just lending services but also other services for the firm, such as public security underwriting? Both academics and regulators have debated this issue for decades. In the United States, commercial banks were permitted to underwrite public securities prior to 1933. However, the stock market crash of 1929 raised concerns over the potential for conflicts of interest and the fear that commingling of investment and commercial banking increased the riskiness of the financial system. In response, Congress passed the Glass-Steagall Act, which effectively prohibited banks from underwriting securities and set the basis for the following sixty year separation of commercial and investment banking. While there has been much rhetoric on potential conflicts of interest when banks combine lending with underwriting, the academic literature on this subject burgeoned only recently.

We begin by reviewing some of the arguments and theoretical models that analyze the implications of banks combining lending with underwriting. Much of the focus of these studies is on the potential for conflicts of interest that can occur when banks use their private information from lending relationships in underwriting their borrowers' public securities. These conflicts of interest are weighed against potential benefits, such as the bank being able to credibly certify the quality of its borrowers to outside investors and generate cost savings from

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[1] Estimates are from Loan Pricing Corporation, which gathers its loan data from SEC filings, large loan syndicators, and a staff of reporters.

[2] Global issuance. Estimates from Thomson Financial.

informational economies of scope. This survey deals with these issues and its scope is defined by our perception of this literature.

The theoretical analyses provide a framework for empirical tests of conflicts of interest. These papers analyze the pricing and long run performance of commercial bank-underwritten securities. The first papers use data on public security offerings from before the enactment of the 1933 Glass-Steagall Act while more recent research uses data from the 1980s and beyond, after the relaxation and eventual repeal of the Glass-Steagall Act. Additional studies test whether banks can use organizational means to reduce the potential for conflicts of interest, and other papers examine the effects of a financial intermediary holding equity claims in firms. We also summarize the international evidence on the interaction between commercial banks and capital markets. There are considerable differences in regulatory environments and quality of the financial markets across countries, so additional insight into the causes and consequences of potential conflicts of interest can be ascertained from these studies. As the literature has grown, researchers have become increasingly sophisticated in using many different empirical methodologies to test for the presence of conflicts of interest. We highlight these methods throughout this survey.

Can investment banks, which generally do not provide lending services, co-exist with commercial banks? Some theoretical models suggest that this is a realistic possibility. For example, issuers may choose commercial banks when economies of scope are large and choose investment banks when the costs from conflicts of interest are sizable. Other models point out the possibility that investment banks and commercial banks can co-exist by charging different underwriter fees that reflect their relative benefits and costs. Another possibility, not generally addressed in the theoretical literature, is that investment banks will compete with commercial banks by expanding their lending activities. We survey the empirical literature on this topic by highlighting a number of papers that examine the effects of commercial bank re-entry into underwriting on the costs of intermediation, the impact of lending relationships on underwriting fees, and whether lending influences the likelihood of winning underwriting mandates.

In addition to the direct interaction between commercial banks and the capital markets, there is an indirect role of commercial banks on capital markets. Through screening and monitoring, banks gather private information about their borrowers. Even if banks do not

directly participate in underwriting, banks' lending decisions can still signal the quality of firms to investors. Generally, researchers have examined this possibility by quantifying the firm's stock price reaction to loan initiations, renewals, and sales. Other studies examine if lending relationships provide positive information to outsiders by documenting the effects of bank loans from non-underwriting banks on the pricing of public security offerings. We provide a detailed summary of banks' ability to convey quality to outsiders through signaling.

Finally, we explore a number of areas where more research is needed. One such topic concerns the ability of banks to hold equity in firms, which is currently limited in the United States but is allowed in other countries, such as Germany and Japan. There is some evidence from the United States on the effects of banks and other financial intermediaries holding equity through venture capital subsidiaries. However, the consequences of banks holding equity remain unclear and highlight the need for additional research so that we can more fully understand the interaction between banks and capital markets.

2. Commercial Banks as Underwriters: Theoretical Literature

When a commercial bank underwrites a firm's public securities, a number of benefits may arise. First, the private nature of the information that a bank gathers in the lending process may be valuable in public security underwriting. Insider banks know more about a firm's prospects than outsiders due to their screening and monitoring of loans. Compared with investment banks, which do not generally acquire private information through lending activities, commercial banks have lower costs of information production. This advantage can allow commercial banks to gather more information about their clients and be better certifiers of firm value than investment banks. Second, banks may achieve informational economies of scope by jointly delivering lending and underwriting services and re-using the same client specific information for several purposes (see e.g. Benston (1990), Saunders and Walter (1994)). As a result, informational economies of scope can lower transaction costs and reduce the costs of intermediation.

However, the potential benefits of commercial banks as underwriters of public securities can be limited by costs that can occur due to conflicts of interest from banks' incentives to misuse their private information. A bank may privately know that a firm has poor prospects but

attempt to protect its own interests by certifying that the firm is of high quality and underwriting public securities, with the hope that investors will subscribe to the issue. The bank then can use the proceeds to pay down its loans to the firm at the expense of outside investors. This activity benefits the bank in two ways -- in addition to earning a fee on the security underwriting, the bank reduces its overall portfolio exposure to default risk. A commercial bank that lends and underwrites may face other conflicts of interest that it may attempt to exploit. For example, banks may issue loans to third-party investors on the condition that these funds are used to support the price of a new issuance of public securities. In this case, the supporting of the security price through bank loans could send incorrect signals to investors and other new issuers regarding the true performance of the underwriter, making the bank appear to be a better underwriter than in truth. As another example, the bank may attempt to "tie" the provision or pricing of credit to the firm's use of the bank's investment banking services. By threatening to reduce the availability of credit or increase the cost of borrowing, the client may then face costs from higher-priced or lower-quality services, with the bank reaping the rewards. Of course, conflicts of interest may be mitigated by the bank's concern for harming ongoing client relationships and its own reputation. It is likely that short-term gains from exploiting these conflicts are offset in the long run by these concerns, which can affect the ability of the bank to generate future business and profits.

Theoretical papers by Kanatas and Qi (1998, 2003), Puri (1999), and Rajan (2002) contrast the benefits that can arise from certification and informational economies of scope with the costs from conflicts of interest. These papers provide formal analyses of allowing banks to extend their business beyond traditional lending activities, and these studies produce some implications for the pricing of public securities, the firm's choice of underwriter, and the costs of financial intermediation.[3]

Rajan (2002) and Kanatas and Qi (1998, 2003) examine the implications of some costs and benefits of universal banking. Rajan (2002) examines if, with unrestricted competition, commercial banks with expanded powers will naturally evolve as efficient institutions. He shows that unrestricted competition does not necessarily lead to efficient institutions if the

[3] In a slightly different vein, Boot and Thakor (1997a,b) examine the impact of the choice between universal and functionally separate banking, and argue that a financial system in its infancy will be bank dominated.

markets in which institutions compete are not naturally competitive. The intuition is that in producing one service (say lending), the integrated producer obtains the possibility of an ex-post rent in producing the second service (say underwriting). This rent can arise because the private information that the bank attains through lending may allow the bank to "capture" the firm.[4] So long as the ex-post rent is greater than the inefficiency that the integrated producer brings to underwriting, the bank can secure the customer's underwriting business. In this setting, universal banks can deter the emergence of other specialized organizational forms. Rajan (2002) argues that this is one plausible scenario for financial institutions not to evolve in the socially optimal way. Of course, whether these conditions apply is an empirical question. Rajan (2002) points out that if underwriting markets are competitive, then commercial banks will be forced to internalize the costs of the structure that they choose. In such a case, regulators can rely on commercial banks to make the right decision about whether to enter into the security underwriting.

Kanatas and Qi (1998) focus on the trade-offs between informational economies of scope and conflicts of interest. The authors assume the existence of the incentive conflict where the bank underwrites low quality firms' securities in order to pay down its bank loans. This incentive conflict limits the ability of the bank to credibly certify the quality of firms that use its underwriting services. Therefore, outside investors pool high-quality security issues with low-quality issues, which increases the financing costs of high-quality firms. High-quality firms can avoid being pooled with low-quality issuers by either using an independent underwriter or borrowing from a lending-only bank. However, by doing so, the firm forgoes any benefits that could arise due to informational economies of scope from using the same bank for both lending and underwriting services. Therefore, universal banks underwrite securities for firms when the benefits of scope economies outweigh the costs from conflicts of interest. In a related study, Kanatas and Qi (2003) develop a model in which economies of scope are a double-edged sword for the universal bank. On the positive side, informational economies of scope provide a cost advantage to universal banks (which is shared with clients) that enables universal banks to lock-

[4] The firm can be captured for two reasons. Fist, the bank has lower costs of information production in security underwriting, which deters competition from other underwriters. Second, the bank's information creates a lemons problem for the firm in that other underwriters will be skeptical of the quality of firms that do not use their universal bank as underwriter.

in their clients' future business. However, on the negative side, the fact that relationships are more durable reduces the incentive for the universal bank to place effort into underwriting the clients' securities. In this model, firms trade-off the benefit of lower costs of dealing with a universal bank with the greater likelihood of successful capital market financing from choosing an investment bank. Two key implications of the model are that universal banks will likely be selected as the underwriter when economies of scope are large, and underwriting allows banks to form and maintain strong relationships in multiple product lines, with firms that use universal banks for underwriting more likely to use the same universal bank for bank lending services.

Puri (1999) models the trade-off between commercial banks' potential to be better certifiers of firm value and the conflict of interest that can arise from the bank misrepresenting the value of a firm's securities in order to use the proceeds to repay bank loans. The formal model is a repeated game where investors are rational and update their beliefs about banks given the last period action, which allows reputation concerns to be captured. Commercial banks know if the firm is good or bad due to previous loan monitoring activities. Commercial banks can underwrite bad firms in order to pay down pre-existing claims, but if investors observe this action, then this observation will reduce the reputation of the bank and its future profits. Investment banks, which do not know the quality of the firm, can incur an investigative cost to determine the true quality of the firm. If they choose not to investigate and subsequently underwrite a low quality firm, the investment bank will suffer through reputation loss. The trade-offs that each underwriter faces determine equilibrium strategies and the prices that the market assigns to underwritten securities. A key result is that commercial banks are likely to obtain better prices for underwritten securities than investment banks when the costs of information production are high, as might be seen in junior and informational sensitive securities.[5] These results help provide theoretical underpinnings for many of the results in the empirical literature. This paper also examines if it is possible for commercial banks and investment banks to coexist in equilibrium and derives sufficient conditions for coexistence in which the level of rent extraction and the relative underwriting fees adjust so that firms are indifferent between going to commercial banks and investment banks. In Section 4, we survey

[5] Of course, there are other scenarios where an investment bank can achieve higher prices than a commercial bank, such as when the costs of investigation for the investment bank are sufficiently small, or when both types of underwriters are perceived to have low reputations.

the empirical evidence on competition between commercial banks and investment banks, including the literature on underwriting fees.

3. Empirical Evidence on Conflicts of Interest

Like the theoretical literature, the empirical studies also examine the benefits and costs of universal banking. Much of the focus of the empirical literature is on the effect of bank's lending, and the private information contained therein, on commercial banks' ability to certify firm value in the presence of potential conflicts of interest. In this section, we provide an overview of this literature. The literature examines these issues over multiple periods of time in the United States. In Section 3.1., we provide a summary of the evidence from before the enactment of the 1933 Glass-Steagall Act, which prohibited commercial banks from underwriting public securities for nearly sixty years. Section 3.2. provides a review of studies that use data from the late 1980s and beyond, after the relaxation and repeal of the Glass-Steagall Act. In Section 3.3., we explore another strand of the literature that examines if commercial banks can use organizational means to mitigate the potential for conflicts of interest. Also, there are papers that explore the consequences of a financial intermediary holding equity claims in firms. We summarize these studies in Section 3.4. Throughout, we highlight the many different methodologies that have been used to test for the presence of conflicts of interest.

There are two primary ways that researchers examine whether banks are net certifiers of firm value or if commercial banks are subject to conflicts of interest. The first method is to examine the ex ante pricing of public securities. The foundation of these studies is that rational investors should anticipate whether commercial banks or investment banks have a higher net certification effect, and price the securities accordingly. If investors perceive that conflicts of interest are large, then commercial bank-underwritten securities will be priced lower than similar investment bank-underwritten securities, while if conflicts of interest are small, then commercial bank issues will achieve higher prices. The second method is to examine the ex post performance of underwritten securities. If commercial bank-underwritten securities perform worse than *ex ante similar* securities that are underwritten by investment banks, then this would be consistent with commercial banks underwriting securities that they privately know to be of lower quality, which is indicative of conflicts of interest. In general, there is little support for

banks' exploiting conflicts of interest. In fact, many studies find commercial banks to be net certifiers of firm value.

3.1. Before the 1933 Glass-Steagall Act

Prior to 1933, commercial banks were permitted to underwrite public securities. However, after the stock market crash of 1929, concerns over the potential for conflicts of interest and the fear that the commingling of investment and commercial banking increases the riskiness of the financial system prompted Congress to enact the Glass-Steagall Act of 1933, which prohibited commercial banks from engaging in public security underwriting. Popular support for the Act came from investigations by the Pecora Committee (U.S. Senate Committee on Banking and Currency, 1933-1934), which examined alleged abuses at the security affiliates of commercial banks, in particular, National City Company and Chase Securities Corporation.[6] However, many scholars have argued that evidence of these concerns was anecdotal and little verification was provided that any abuses were systematic in nature (see e.g. Carosso (1985), Benston (1990)).[7] Below, we highlight the formal empirical analyses that explore if the committee's concerns were justified.

Puri (1996) examines the ex ante pricing of industrial bonds and preferred stock during the period January 1927 through September 1929. She regresses the yield of the securities on a dummy variable that indicates if the issue is commercial bank-underwritten, and she includes control variables for bond characteristics and issuer characteristics that could also affect the yield.[8] She finds that, relative to investment bank issues, commercial bank-underwritten issues have a significantly lower yield, which is consistent with commercial banks having a net certification effect. Of course, there are other explanations (other than net certification) that could account for this yield difference. Hence the author conducts a number of tests to determine if yield differences are higher in junior and more information sensitive securities as

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[6] See Kelly (1985) for details on the legal history of the Glass-Steagall Act.
[7] In recent times, regulators have raised questions on the firm-level and competitive effects of the relaxation and repeal of the Glass-Steagall Act (see e.g. Mester (1996), Berger, Demsetz, and Strahan (1999), Santomero and Eckles (2000)).
[8] The yield is defined as the premium of the ex ante yield of the security over the ex ante yield of a government bond of nearest maturity issued in the same month.

suggested in Puri (1999). She finds that having a commercial bank underwriter has a significantly larger effect on yield in samples where private information is likely to be more important. For example, the strongest effects are in the preferred stock sample, which is junior and more sensitive to information than bonds. There are also stronger effects for new issues than seasoned issues and non investment-grade issues than investment-grade securities. Further, there is little effect of underwriter type on foreign government bond issues, which are not information intensive.

The baseline tests in Puri (1996) use OLS regressions of yield on control variables and a bank underwriting dummy, and use the coefficient on the dummy to infer whether a bank underwriting lowers yields. This is a standard approach prevalent in empirical banking and corporate finance research. Puri also conducts additional tests to examine whether the lower yield of bank underwritings can be attributed to the private information held by banks. Her approach is to estimate private information as a residual and use its correlation with the next-stage dependent variable as a basis for testing whether private information matters. In the specific implementation of this approach in Puri (1996), a probit model is used to determine the probability of being bank underwritten. The estimates are used to compute the inverse Mills ratio, which is a proxy for private information because it is the expectation of the residuals not explained by public information. The coefficient for the inverse Mills ratio is negative, consistent with a net certification effect for commercial bank underwritten offerings. Interestingly, Puri's technique parallels a similar approach used subsequently in the insurance literature, where Chiappori and Salanie (2000) test whether customers buying more comprehensive automobile insurance coverage have private information that they have higher accident probabilities. Like Puri (1996), Chiappori and Salanie (2000) also estimate private information as a residual and use its correlation with the second stage dependent variable as a basis for testing whether private information matters.

Clearly, many different approaches can be used to assess the benefits of bank underwriting, and a number of these techniques are utilized in studies of the post-1990 period and in examinations of underwriter fees, which we will discuss later. For example, an alternate approach is to use endogenous switching models (see e.g. Fang (2005), Song (2004) for applications and Maddala (1983) for details on the model). These models generalize the two-stage approach used in Puri (1996) by allowing commercial banks and investment banks to have

separate yield equations. This relaxes the assumption that the variables that affect yield have the same effect for investment bank and commercial bank issues. Estimating the model involves two steps. First, the researcher runs a probit model to determine the probability that the issuer chooses a commercial bank or investment bank underwriter. In the second step, the researcher estimates two yield equations separately for investment bank and commercial bank issues, including independent variables that affect yield as well as the inverse Mills ratio. Interestingly, when we apply endogenous switching methodology to industrial bonds in the pre-1933 data, similar effects are found.

The evidence that investors paid more for bank underwritten-securities pre-Glass-Steagall suggests that commercial banks are net certifiers of firm value. However, this raises an important question of interpretation. Namely, did investors pay more for bank-underwritten securities because they rationally believed them to be of better quality, or were investors naïve and banks took advantage of them so that investors paid higher prices for worse securities? This question can be addressed by examining the ex post performance of bank underwritten securities. Ang and Richardson (1994), Kroszner and Rajan (1994), and Puri (1994) examine the ex post performance of securities using data from the pre-Glass-Steagall period. As noted, if commercial bank-underwritten securities perform worse than ex ante similar securities that are underwritten by investment banks, then this would be consistent with commercial banks underwriting securities that they privately know to be of lower quality. All three studies find no evidence to support the existence of conflicts of interest.

Ang and Richardson (1994) examine the long-run performance of bonds, using a comprehensive sample of 647 bond issuances over the years 1926 through 1930. The authors compare the default rate of commercial bank and investment bank-underwritten bonds based on the default status of the bonds at two points in time (1934 and 1939) and find that the default rates are similar for investment bank- and commercial bank-underwritten securities. While this analysis is limited because the authors do not control for differences in the characteristics of issuers across the two types of underwriter, the results suggest that conflicts of interest did not override the certification ability of commercial banks.

Kroszner and Rajan (1994), using data from the first quarters of the years 1921 through 1929, examine the relative performance of industrial bonds that are underwritten by commercial

banks with those that are investment bank-underwritten. The main measure of bond performance is the default rate because reliable price data is scare for this time period. To compare default performance between ex ante similar bonds, the authors use two methods: (i) matched-security tests, where bonds originated by commercial bank affiliates are matched to similar investment bank-underwritten bonds based on observable characteristics; and, (ii) logit analysis. For the matched-security tests, the authors create a sample of ex ante similar commercial bank and investment bank-underwritten securities, using the credit rating as the primary measure of bond quality. In total, Kroszner and Rajan (1994) find 121 industrial bond matches, where the bonds have the same initial credit rating, are issued within six months of each other, have similar maturity and size, and have the same conversion provision.[9] Using this sample, the authors find that at the end of each year after 1924, there are fewer cumulative defaults among commercial bank-underwritten issues, and by the end of the sample period in 1940, 32 percent of investment bank-underwritten bonds defaulted relative to 23 percent of bonds that were underwritten by commercial banks. By dollar volume, approximately 28 percent of investment bank-underwritten issues default by 1940, compared with only 11 percent of commercial bank-underwritten issues. Further, not only do investment bank-underwritten issues default more frequently, but they also default earlier in their lives. All of these findings suggest that commercial bank-underwritten issues performed better than similar, investment bank-underwritten issues, which is inconsistent with commercial banks succumbing to conflicts of interest.

In addition, Kroszner and Rajan (1994) perform a log-rank test using the sample of matched securities. This test takes into account both the number of defaults and the timing of defaults by comparing the mortality rates of the two groups of bonds. Consistent with their initial findings, the main result of this test is that the survival rate of commercial bank-underwritten bonds is significantly higher than investment bank-underwritten bonds. Importantly, these differences are strong in the non investment-grade sample, but insignificant in the investment-grade sample. Since incentive conflicts created by information asymmetries between underwriters and investors are larger in low quality issues, this result supports the view that conflicts of interest were not large during the pre-Glass-Steagall period.

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[9] If there are multiple matches, the authors use other criteria, such as collateralization status, to select the best match.

Kroszner and Rajan (1994) confirm the lower default probability of commercial bank-underwritten issues using logit analysis in which they estimate whether the type of underwriter affects the probability of default, after controlling for security and firm characteristics. The logit analysis complements the matched-security tests by allowing the authors to use data on all of the investment bank-underwritten issues (instead of just the smaller sample that is matched to commercial bank-underwritten issues) and providing means to control for other factors that may be correlated with default. According to the estimates from logit models, underwriting by a commercial bank reduces the probability of default by 11 percent, with large and significant reductions in default probabilities seen among the lowest quality issues. In economic terms, an 11 percent difference in the probability of default is approximately the same as the difference in default probability between investment-grade bonds and unrated bonds.

Puri (1994) also examines the long run default performance of bank-underwritten issues. The author uses both the cumulative mortality rate and probit models to examine the default performance of bonds. The cumulative mortality rate allows for an accurate comparison of default probability by measuring default rates on bonds that have been outstanding for equal periods of time, adjusted for calls, maturities, and previous defaults.[10] Using a sample of industrial bond issues during the period January 1927 through September 1929, Puri (1994) finds that the cumulative mortality rate is significantly higher for non-bank underwritten issues than bank underwritten issues for 3, 5, and 7 years from the issue date.[11] These results are particularly strong in the non-investment grade sample for all time periods. The results support the view that banks were not exploiting conflicts of interest. While the mortality rate analysis is better than an unconditional comparison of default rates, the probit model allows the researcher to control for other important factors that might influence the probability of default. Consistent with the mortality analysis, the results of the probit model strongly indicate that commercial bank underwritings of industrial bonds and preferred stock defaulted less often, and foreign government bonds defaulted with similar probability. Interestingly, Puri (1994) finds that there was a selection bias in the Senate hearings that lead to the Glass-Steagall Act. The two banks

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[10] See Altman (1989) for a formal definition and discussion.

[11] The sample period for this study provides for a more uniform regulatory and economic environment, as it starts after the passage of the McFadden Act, which legally allowed national banks to underwrite debt securities, and ends before the stock market crash of October 1929.

that bore the brunt of the investigation underwrote securities that had a significantly higher default rates than that of other banks and were not representative of bank underwriters in general.

Together, the ex ante pricing results and the long run performance studies paint a convincing picture. Commercial bank-underwritten securities received higher prices. Investors rationally paid higher prices because in the long run these securities performed better than ex ante similar offerings. This suggests that conflicts of interest were not dominant in bank-underwritings during the pre Glass-Steagall period.

3.2. The Late 1980s and Beyond

During the late 1980s and throughout the 1990s, commercial banks were gradually allowed to re-enter underwriting markets. In 1987, the Federal Reserve permitted individual bank holding companies to establish Section 20 subsidiaries that could to a limited extent engage in "bank ineligible" activities.[12] However, the subsidiaries had to be separately capitalized and separated from the lending parent by information, finance, and resource firewalls. In 1989, Section 20 affiliates were permitted to underwrite corporate debt, and in 1990, the Federal Reserve granted equity underwriting powers. The Federal Reserve set an initial revenue cap on bank ineligible activities at 5 percent of the gross revenue of the Section 20 subsidiary, and the cap was raised to 10 percent in 1989 and then to 25 percent in December 1996.[13] In 1997, the Federal Reserve removed the majority of firewalls between Section 20 subsidiaries and their bank holding company parents, and on November 12, 1999, the Gramm-Leach-Bliley Act (Financial Modernization Act) effectively repealed the Glass-Steagall Act.

There are a number of papers that use more recent data to examine the pricing of securities underwritten by commercial banks. As in the pre Glass-Steagall period, most of the evidence points to a net certification effect for commercial banks. Gande, Puri, Saunders, and Walter (1997) examine the pricing of debt securities from January 1, 1993 to March 31, 1995, a period when commercial banks' underwriting affiliates were constrained by regulation that

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[12] Section 20 of the Glass-Steagall Act prevented commercial banks from affiliating with a company "engaged principally" in the "issue, flotation, underwriting, public sale, or distribution at wholesale or retail or through syndicate participation of stocks, bonds, debentures, notes or other securities."

[13] Note that the other revenue of the Section 20 subsidiary comes from "eligible" activities, such as swaps origination and government bond underwriting.

limited their ability to generate revenues and faced significant firewalls that could reduce information flow between the underwriting affiliate and the parent commercial bank. The authors are able to measure the amount of lending exposure between the issuer and the underwriter, which, as per the theory, should be important in determining security prices. The authors find that commercial banks primarily underwrite small issues, which is consistent with a positive role of banks in bringing smaller issuers to the market. Importantly, after controlling for bond characteristics, issuer characteristics, and underwriter attributes, the authors find that underwritings where the bank has existing lending exposure have significantly lower yields for lower credit rated (Caa-Ba3) issues, but no difference on the less informationally sensitive, higher rated issues.[14] Again, these results are consistent with bank underwriting being valuable for lower credit rated issues due to a net certification effect. Further, if conflicts of interest are present, they are likely to be highest when the purpose of the debt issuance is to refinance existing bank debt because in these issues, the bank may misrepresent the quality of the firm so that the issuer can raise more money to pay down its existing exposure to the bank. Among this sample of issues, the effect of lending exposure on yields is economically and statistically insignificant, indicating a lack of conflicts of interest. As an additional robustness check, the authors create a proxy for private information by estimating the residuals in a probit model where the dependent variable is one if lending bank is the underwriter. These residuals are found to be correlated with reduced yields for lower credit rated issues, after controlling for publicly available bond characteristics, consistent with a net certification effect.

A follow-up paper by Roten and Mullineaux (2002) uses similar methods as Gande et al. (1997), but examines a later time period: January 1, 1995 to December 31, 1998. During this period, many of the restrictions on commercial bank underwriting were relaxed. Roten and Mullineaux (2002) find the benefits of bank underwriting in this later period show up in reduced underwriting fees rather than in net yields. There is more work on the underwriting fee differentials between commercial and investment banks that we will discuss in more detail in Section 4.1.

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[14] For lower credit rated issues, a one-unit increase in LN(Amount of lending exposure) reduces yields by 27 basis points for lower-credit rated issues. An alternative measure, PROP(STAKE), which is the lending exposure over the amount of the debt issue size, produces similar results.

Thus far, we have focused on the effect of commercial bank underwriting on public debt issues. A few recent papers examine equity issues. In equity markets, an indirect cost of initial public offerings (IPOs) is underpricing, where the price of the security at offering is, on average, below the price prevailing in the market shortly after the IPO.[15] It is well documented that IPOs are underpriced, and many theoretical papers indicate that IPO underpricing arises from asymmetric information problems regarding the issuing firm's value (see e.g. Rock (1986), Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Welch (1989, 1992)). The benefits of bank lending relationships are likely to be especially important when a firm goes public due to the substantial uncertainty about a firm's value. However, the consequences of conflicts of interest can be more severe in IPOs due to equity being junior to debt and the pronounced asymmetric problems with private firms.

Schenone (2004) examines the effect of having a banking relationship with the underwriter of the IPO on the firm's IPO underpricing. If conflicts of interest are high, then investors may perceive stocks underwritten by relationship banks to be riskier than other IPOs. Using a sample of 306 IPOs from 1998 through 2000, the author finds that IPOs underwritten by a firm's relationship bank are less underpriced than IPOs where the firm does not have lending relationships with any potential underwriter. In addition, there is no significant difference in underpricing relative to firms that could have, but do not, use their relationship bank as underwriter. These results indicate that IPOs with relationship banks are, at a minimum, not perceived to be riskier than other IPOs, supporting that conflicts of interest do not override the certification ability of the bank.

Benzoni and Schenone (2004) examine the long run performance of equity issues that are underwritten by the firms' relationship banks relative to those issues that are underwritten by other commercial bank and investment bank underwriters. The focus on ex post performance is similar to Ang and Richardson (1994), Kroszner and Rajan (1994), and Puri (1994). The main differences are that Benzoni and Schenone (2004) use modern data from 1998 through 2000 and examine equity issues as opposed to debt issues. The authors examine the impact of lending

[15] Underpricing is defined as the differences between the first closing pricing and the offer price, divided by the offer price. See Ritter (1998) for a survey of empirical evidence.

relationships on the firm's long run equity performance in two ways. First, for each of the 306 IPO firms, the authors construct 2-year buy-and-hold returns for the firm's stock as well as the buy-and-hold returns for two benchmark portfolios, one of which is specific to each firm and is comprised of the returns on six portfolios of stock ranked by size and book-to-market, and the other is the CRSP value-weighted market portfolio. Using feasible generalized least squares to account for cross-sectional correlation in the stock returns of firms, the authors estimate the impact of having an existing lending relationship with the underwriter on the long-run returns of the IPO firm relative to the benchmark portfolios, controlling for firm characteristics, IPO characteristics, and other factors. The authors find that IPOs underwritten by relationship banks perform no better or worse than issues underwritten by outside commercial or investment banks. This result is inconsistent with relationship banks misrepresenting the quality of the firm's that they underwrite. Second, for each IPO underwritten by the firm's relationship bank, the authors find a similar matched IPO from the sample of non-relationship bank IPOs based on the dates of the IPOs and the book-to-market ratios of the firms. Benzoni and Schenone (2004) form a portfolio of long positions in the relationship bank IPO firms and short positions in the matched sample of non-relationship bank IPO firms. The authors regress the weekly portfolio returns on Fama and French's (1993) market, size, and book-to-market returns and examine if there are abnormal returns associated with this portfolio. The authors do not find significant abnormal returns, indicating that relationship bank-underwritten firms perform similarly to the matched sample, which is again inconsistent with relationship banks misrepresenting the quality of the firm's that they underwrite.

As in the pre Glass-Steagall period, the evidence from the late 1980s and beyond suggests that conflicts of interest are not dominant in bank underwritings. The ex ante pricing results indicate that when the firm and underwriting commercial bank have a lending relationship, the public security prices are no worse and sometimes better than similar issues underwritten by investment banks or non-relationship commercial banks. These results are robust to different methodologies, time periods, and types of security. Further, the long run performance of relationship bank-underwritten IPOs are no worse than similar IPOs that are underwritten by non-relationship banks, which is inconsistent with the existence of conflicts of interest.

3.3. Mitigating Conflicts of Interest: Organizational Structure and Syndicates

The aforementioned papers examine the trade-offs between certification and conflicts of interest by analyzing the ex-ante yield of debt, the underpricing of equity securities, and the ex post performance of securities. The evidence suggests that bank certification at least cancels out and may outweigh potential conflicts of interest. While these studies take as given, and attempt to quantify, the relative magnitude of these offsetting effects, a number of papers examine if there are ways for commercial banks to take action to reduce the potential for conflicts of interest. In other words, can commercial banks credibly commit to certifying firm value in order to mitigate any perception that they will exploit conflicts of interest?

Puri (1996) and Kroszner and Rajan (1997) examine if the organizational structure of the financial institution can mitigate potential conflicts of interest. During the pre Glass-Steagall period, commercial banks organized their investment banks as either internal securities departments within the bank or as separately incorporated affiliates with their own boards of directors. By forming independent entities, banks may be able to credibly commit to not exploit potential conflicts of interest that could be pronounced due to the likelihood of increased information flows in an internal structure. Puri (1996) finds that affiliate underwritings do not have significantly lower yields than similar investment bank issues, while in-house underwritings have significantly lower yields when compared with investment bank issues. Her results do not support the view that independent entities were beneficial. However, these results contrast with Kroszner and Rajan (1997). Using a sample of 422 industrial bonds from 1925 through 1929, the authors compare the initial yields on issues underwritten by internal departments with issues that are underwritten by separate affiliates. The results of their multivariate regression suggest that independent affiliate-underwritten issues have yields that are significantly lower than internal department-underwritten bonds, by 12 to 23 basis points. These results are consistent with the independent structure allowing for credible commitment. There are some differences in the samples and approaches of these two studies. Clearly, more research is needed to sort out this question.

Narayanan, Rangan, and Rangan (2004) and Song (2004) explore another way for commercial banks to credibly commit to certify firm value and avoid conflicts of interest. These authors examine the role of syndicate structure in underwriting. Narayanan et al. (2004) focus

on the possibility that a relationship bank may co-manage an issuance with a reputable, non-lending underwriter in order to commit against opportunistic behavior. Using 1,640 seasoned equity issuances from the years 1994 through 1997, Narayanan et al. (2004) find that the proportion of syndicate co-manger roles to lead manager roles for relationship banks is about three times higher than for non-relationship banks. Also, relationship banks are significantly more likely than non-lending banks to co-manage an issue with an independent, high reputation lead manager. Further, an examination of the pricing of these issues reveals that issues where a relationship bank is a co-manager exhibit similar levels of underpricing as issues where only investment banks are underwriters. Taken together, these results are consistent with the view that relationship banks use the syndicate structure to credibly commit against exploiting potential conflicts of interest. Importantly, similar to the results in Roten and Mullineaux (2002) for debt issuances, Narayanan et al. (2004) show that while issuers do not receive better pricing on their equity issuance, the issuer benefits from reduced underwriting fees. We discuss this further in Section 4.1.

Another interpretation of the underpricing results in Narayanan et al. (2004) is that relationship banks do not improve the certification ability of the syndicate. Otherwise, we would observe lower underpricing on issues where relationship banks are co-managers. However, to really examine if co-managing allows relationship banks to *improve* their net certification of issues relative to lead managing, one would have to contrast underpricing between issues that are co-managed by relationship banks with similar issues that are lead managed by *relationship banks*. This comparison is not provided in Narayanan et al. (2004) due to a lack of commercial bank lead managed issues during the time period. However, Song (2004) is able to make a related comparison in the bond underwriting market. Using a sample of 2,345 corporate bond issues from 1991 to 1996, Song (2004) examines the clienteles and bond pricing associated with three different syndicate structures: (i) commercial bank-lead syndicates; (ii) syndicates with only investment banks; and, (iii) hybrid syndicates where an investment bank leads the issue and commercial banks are co-managers. Song uses an endogenous switching model with six equations: three selection equations, which capture the likelihood of choosing a given syndicate

structure over the other options, and three yield equations, one for each of the three syndicates.[16] The results of her model indicate that commercial banks are more likely to co-manage an issue rather than serve as lead manager when the purpose of the issue is to refinance bank debt and the issuer has more loans from the commercial bank underwriters. Since these issues are more likely to be prone to conflicts of interest, the results are consistent with the view that acting as a co-manager allows commercial banks to mitigate perceptions that they will exploit conflicts of interest. However, bond yields are similar when commercial banks are lead managers as opposed to co-managers. This suggests that co-managing does not improve the certification ability of commercial banks.

3.4. Conflicts of Interest from Equity Holdings: Evidence from Venture Capital

Much of the focus so far has been on the trade-off between the private information from lending allowing banks to be better certifiers of firm value with the potential for conflicts of interest from misusing the information. In this section, we again explore this trade-off, but examine some of the different effects that can occur when underwriters are equity holders in the firm. The evidence from venture capital can provide insight into the potential consequences of allowing banks to hold equity in firms.

Some authors maintain that allowing banks to hold equity claims helps increase a financial intermediary's credibility in certifying the firm's value (see e.g. Leland and Pyle (1977)), which provides a formal analysis of how equity holdings in the firm can provide a signal of firm value). However, as Puri's (1999) model points out, the horizon for which equity is held is critical to this certification. If the bank can retire its financial claim through the proceeds of the equity issuance, then holding equity can hurt the credibility of the bank more than holding debt. There is some empirical evidence on the impact of equity holdings on the certification ability of the underwriter, derived from comparing IPOs where the underwriter has gained an

[16] In another application of this method, Fang (2005) studies the relation between investment bank reputation and the prices of underwritten bonds and uses separate pricing equations for high and low reputation underwriters. Fang (2005) finds that more reputable underwriters obtain lower yields and charge higher fees.

equity stake through venture capital investments and other IPOs where the underwriter does not have an equity claim. Both papers that we survey do not find evidence of conflicts of interest.

Using a sample of 885 venture-backed IPOs from December 1972 to December 1992, Gompers and Lerner (1999) compare long run performance, liquidation probability, and underpricing based on if an underwriter in the IPO holds a venture stake. To examine long-run performance, Gompers and Lerner (1999) calculate the 5-year buy-and-hold excess return, which is the firm's buy-and-hold return minus the 5-year buy-and-hold return of the portfolio of firms with the same size and book-to-market ratio. This comparison reveals that issues where the investment bank held an equity stake perform just as well, and by some measures significantly better than, non-affiliated offerings. These results are inconsistent with the existence of conflicts of interest. Further, the authors explore if excess returns are influenced by the percentage of venture investors' equity sold at the time of the IPO. If venture investors are attempting to take advantage of outsider investors, then higher fractions of equity sold should result in lower excess returns. They find no evidence to support this hypothesis, and in fact, find the opposite to be true. In addition, Gompers and Lerner (1999) examine the probability that a firm is liquidated within 5-years of the IPO and find no significant relationship between liquidation probability and using an underwriter that has a venture claim in the firm. Again, these results suggest that conflicts of interest are not a concern. Further supporting this view, when examining underpricing, the authors do not find a significant difference between IPOs that are underwritten by affiliated underwriters and independent underwriters.

Li and Masulius (2004) also examine the impact of venture capital investments by IPO underwriters on the net certification ability of the underwriter. However, as opposed to Gompers and Lerner (1999) who treat all existing venture relationships as equally important, Li and Masulius (2004) examine if the size of the equity ownership by the underwriter affects IPO underpricing and the probability of being delisted in the future. This approach is similar to that in Gande et al. (1997). Using a sample of 1,480 venture-backed IPOs from 1993 to 2000, the authors find that IPO underpricing decreases as the share of the underwriter's equity ownership increases, even after controlling for other factors that can influence underpricing. The underpricing results are consistent with certification effects overriding any conflicts of interest. In support, the authors find that among issues that are more uncertain, which is proxied for by the firm's stock volatility during the year following IPO, venture investments reduce

underpricing more than for less risky issues. This suggests that the prior information from the venture investment allows the underwriter to reduce informational asymmetries. Similar to Gompers and Lerner's (1999) evaluation of liquidation, Li and Masulius (2004) find no significant relationship between underwriter shareholdings and the likelihood of subsequent stock delisting, which is consistent with conflicts of interest not being pronounced.

The evidence in these two studies highlight that conflicts of interest are not a concern when an underwriter holds an equity stake in the firm. Further, the analysis in Li and Masulius (2004) suggests there are benefits from the underwriter holding an equity stake, with affiliated underwriters being net certifiers of firm value and allowing for firms to reduce their direct costs of going public.

4. Empirical Evidence on Competition between Commercial and Investment Banks

The empirical evidence in Section 3 on conflicts of interest raises an important point: If commercial banks are net certifiers of firm value and conflicts of interest can be mitigated, then commercial banks may be superior underwriters as compared with investment banks. If so, can both types of underwriter co-exist? How can competition between them affect the services they offer to firms?

By combining lending with underwriting, banks may achieve informational economies of scope by jointly delivering lending and underwriting services and re-using the same client specific information for several purposes (see e.g. Benston (1990), Saunders and Walter (1994)). As emphasized in Kanatas and Qi (2003), informational economies of scope can lower transaction costs and can theoretically reduce underwriting fees if banks pass along costs savings to firms. Puri (1999) derives sufficient conditions for commercial banks and investment banks to coexist. One implication of this analysis drawn out in the paper is that, under some circumstances, commercial banks may charge higher underwriting fees than investment banks. We survey the literature on underwriting fees in Section 4.1. The analyses in Kanatas and Qi (1998, 2003) emphasize that large scope economies from combining lending and underwriting will be important in determining if an issuer selects its commercial bank lender as public security underwriter. Rajan (2002) points out that the bank's information advantage from lending may allow it to secure the underwriting mandates of its borrowers. In Section 4.2., we summarize the

studies that examine the effect of bank lending on underwriter selection. In Section 4.3., we provide some additional evidence on how investment banks are adapting to competition from commercial banks.

4.1. Underwriting Fees

We begin by providing evidence that commercial bank entry after the relaxation of the Glass-Steagall Act caused lower overall underwriting fees, consistent with a pro-competitive effect on corporate securities underwriting markets. Gande, Puri, and Saunders (1999), using a sample of 2,992 debt issues from 1985 through 1996, document that following bank entry into debt underwriting in 1989, the gross spread, or underwriting fee, declined significantly.[17] Further, this decline is more pronounced in samples where commercial banks gained a larger market share (non-investment-grade and smaller issues).[18] This result stands in interesting contrast to equity markets where commercial banks had not yet gained much market share, and where similar declines in gross spreads are not observed in this time period.

Gande et al. (1999) also find that among the sample of 1,180 debt issues between 1989 and 1996, commercial banks and investment banks charge similar fees. A number of studies build on this comparison of fees by focusing directly on the impact of lending relationships on gross spreads. In public debt markets, two studies find that prior lending relationships reduce the gross spread. Using a regression framework that controls for bond and issuer characteristics, Roten and Mullineaux (2002) find that prior lending relationships lower debt underwriting fees by 10 basis points during the 1995 to 1998 period. Yasuda (2005) gathers a sample of 1,535 bond issues from 1993 to 1997 and uses a more advanced methodology to examine the impact of lending relationships on fees. The author points out that studies that examine the effect of lending relationships on fees use the equilibrium pricing outcomes that are observed. Yasuda (2005) argues that the gross spread that is observed is likely to be lower on average than the unconditional distribution of the gross spread. Therefore, the author imputes the implied gross

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[17] The authors capture the impact of bank competition on gross spreads in two ways. First, they use a dummy variable that is one after 1989, when banks were first allowed to underwrite corporate debt. Second, they use the logarithm of commercial banks market share in debt underwriting.

[18] Supporting that the decline in spreads is due to commercial bank entry is that in equity markets, where there was very little commercial bank underwriting activity prior to 1996, there was no significant decline in gross spreads.

spread for each of the other underwriters that the firm could have selected to underwrite the issue. Using the Expectation-Maximization Algorithm that accounts for this downward bias in observed gross spread, Yasuda (2005) estimates a joint model of the gross spread and the firm's selection of underwriter. The gross spread is modeled as a function of bond and issuer characteristics, as well as if the potential underwriter was an arranger on any of the firm's prior loans before 1993. The choice of underwriter is a function of the implied gross spread, bond and issuer characteristics, and existing lending relationships. Yasuda (2005) also finds that lending relationships significantly decrease the gross spread by approximately nine basis points.

As in debt underwriting, the evidence suggests that lending reduces the gross spreads of equity offerings. Three papers use the framework developed by Altinkilic and Hansen (2000), who find that gross spreads for seasoned equity offerings are U-shaped with respect to the size of the offering. Theoretically, U-shaped curves can arise because scale economies cause gross spreads to decline initially, but as issue size increases, higher placement costs can override the benefits of scale economies, causing gross spreads to increase. Narayanan et al. (2004), using seasoned equity offerings from 1994 to 1997, include a variable that captures if a commercial bank in the underwriting syndicate has a lending relationship with the issuing firm. They find that the existence of a lending relationship reduces gross spreads by 46 basis points, which is significant at the one percent level. This result is consistent with informational economies of scope from combining lending and underwriting. Drucker and Puri (2005) study "concurrent lending" and underwriting, which occurs when the underwriter of a seasoned equity offering provides a loan to the issuer between six months before and six months after the issuance. As part of their study, the authors examine the impact of concurrent lending and prior lending on seasoned equity offering gross spreads. The authors argue that informational economies of scope are likely to be large when issuers receive a loan concurrently because the information from the lending transaction is directly re-usable in the equity offering. The authors extend the Altinkilic and Hansen (2000) model to include variables that control for firm characteristics and prior underwriting relationships as well as variables that indicate if the lead underwriter provided concurrent loans or had a prior lending relationship with the issuer. For a sample of 2,301 seasoned equity offerings from 1996 through 2001, concurrent lending without a prior lending relationship significantly reduces gross spreads by 18 basis points and concurrent lending where a prior lending relationship exists results in gross spreads that are 36 basis points lower. Prior

lending relationships without a concurrent loan also cause gross spreads to be reduced significantly, by 36 basis points. These discounts are consistent with the existence of informational economies of scope. Further, the discounts for concurrent and prior lending relationships are significant in the sample of non-investment-grade issuers, where economies of scope from combining lending and underwriting are likely to be large. Bharath, Dahiya, Saunders, and Srinivasan (2004) use a sample of 283 initial public offerings and estimate U-shaped models that separately include three different measures of lending relationship strength. These measures capture if the firm and underwriter have a prior lending relationship, the proportion of the firm's loans over the five years prior to the IPO where the underwriter had a lead role, and the dollar-based percentage of the firm's loans where the underwriter had a lead role. In all three cases, gross spreads are significantly lower by 19 to 26 basis points.

4.2. Underwriter Selection

In general, the evidence points to better pricing and lower underwriting fees from using a relationship bank as underwriter. Presumably, the benefits of using a relationship lender as security underwriter will influence the firm's choice of underwriter. Is there evidence that lending relationships allow underwriters to increase their likelihood of winning underwriting mandates? Four recent papers examine the effect of lending on a firm's choice of underwriter, and all find that lending increases the likelihood of winning underwriting business.

Drucker and Puri (2005) examine if lending around the time of a securities offering (concurrent lending) and prior lending impact the choice of seasoned equity underwriter. The authors use McFadden's (1973) choice model to examine the choice of underwriter. The authors allow the choice of underwriter to depend upon concurrent and prior lending, firm characteristics, and attributes that are specific to the relationships between each firm and potential underwriter, such as the analyst coverage and the quality of the coverage that potential underwriters provide for the firm, the reputation of potential underwriters, and any existing underwriting relationships. The results of this model reveal that both concurrent lending and prior lending increase the likelihood of the bank being selected as the lead underwriter. Further, the authors examine if concurrent lending increases the likelihood that underwriters are selected for future equity underwriting business. Using a nested logit model in which the issuer first

chooses if it will re-issue in the equity market and then chooses if it will keep the same underwriter or switch to a new underwriter, the authors find that concurrent lending increases the likelihood that investment banks keep future underwriting business, which is consistent with lending fostering an ongoing relationship between underwriters and firms.

In a related paper, Bharath et al. (2004) examines the impact of prior lending on capturing debt and equity underwriting business. The authors use a logit model, allowing each issuer to choose among the top-20 investment banks and any commercial bank that could underwrite its securities. They allow the choice of underwriter to depend upon the size of the issue, existing lending and underwriting relationships, and the reputation of the underwriters in both the underwriting and lending market. Bharath et al. (2004) find that prior lending relationships significantly increase the likelihood of winning debt underwriting mandates and being selected as lead manager on IPOs.

Ljungqvist, Marston, and Wilhelm (2006) also provide evidence related to the influence of bank lending relationships on underwriter selection. Using a sample of 16,625 debt and equity deals over the period December 1993 to December 2002, the authors estimate a probit model, providing each firm with the potential to choose any of the 16 most active underwriters. In their model, the choice of underwriter depends upon bank-firm underwriting and lending relationships, as well as bank reputation and analyst characteristics and behavior. Ljungqvist et al. (2006) find that the probability of winning both equity and debt underwriting business is increasing in the bank's share of the issuer's prior loans.

Yasuda (2005) provides an examination of the impact of existing lending relationships on the choice of debt underwriter during the period 1993 to 1997. As previously explained, Yasuda (2005) estimates a joint model of the gross spread and the firm's selection of underwriter, allowing the firm to choose between sixteen underwriters. The joint framework allows the author to include in the underwriter selection equation the estimated fee that each underwriter would have charged the issuer to underwrite the offering. Therefore, Yasuda (2005) can examine if the lending relationship influences underwriter selection above and beyond any effect that charging lower gross spreads has on underwriter selection. The author finds that prior lending relationships significantly increase the likelihood that the lending bank wins the bond underwriting business over and above the effect of the gross spread discount. Further, lending

relationships have a stronger impact on underwriter selection among junk rated issuers and new issuers, where a bank's private information is likely to be most valuable. These results are consistent with Kanatas and Qi's (1998, 2003) theoretical models, which indicate that lenders will select their bank as underwriter when there are likely to be large informational economies of scope. The estimates of Yasuda's (2005) model indicate that firms are willing to pay a higher underwriter fee to banks with which they have a prior relationship. One of the major benefits of this framework is that the author can explicitly calculate how much more an issuer is willing to pay. For the sample mean issue size of $180 million, an issuer is willing to pay $2.23 million more to use a relationship commercial bank and $2.62 million to have a relationship investment bank as underwriter. Junk rated issuers and first time issuers, where the value of a bank's private information is likely to be largest, are willing to pay even more. These results are consistent with a certification effect for relationship banks.

4.3. Can Investment Banks Survive?

Overall, the empirical evidence shows that using relationship banks as underwriters improves the pricing of issues and lowers fees, and both prior lending relationships and lending around the time of a security issuance increase the probability that an underwriter will be selected as underwriter. Further, as Yasuda (2005) points out, lending relationships increase the likelihood of selection above and beyond any cost reductions. Given these facts, is it possible for investment banks to remain viable underwriters?

One possibility is that investment banks can remain viable competitors by expanding their lending activities. Some evidence of investment bank lending and its effects on financing costs and the choice of underwriter is provided in Drucker and Puri (2005). They document that investment banks are now making loans and are competing aggressively with commercial banks by providing loans around the time of seasoned equity offerings.[19] While the authors show that, in concurrent deals, investment banks cannot compete with commercial banks on the yield spreads that they can charge for the loan, concurrent lending and prior lending allow investment banks to provide lower gross spreads on the equity offering, with investment bank lending

[19] In fact, of the 201 issues where the underwriter provides a loan concurrently with the seasoned equity offering, investment banks are the underwriter in 110 cases.

significantly reducing gross spreads by between 26 and 44 basis points. These results are consistent with lending by investment banks creating sufficient economies of scope to allow investment banks to be viable competitors with commercial banks. This inference is bolstered by an examination of issuers' selection of their underwriter. As with commercial banks, when investment banks have prior lending relationships or provide concurrent loans, their likelihood of being selected as equity underwriter increases. Further, investment banks are able to leverage concurrent deals into extended relationships by capturing future underwriting business.

The evidence in Yasuda (2005) also hints that investment banks may use lending to compete with commercial banks. Her model shows that for the mean debt issue, issuers that have a lending relationship with an investment bank underwriter are willing to pay more to use the relationship investment bank as underwriter. Further, investment bank lending increases the likelihood of winning the underwriting mandate. These results suggest that firms value lending relationships with investment banks, and as a result, lending may allow investment banks to remain competitive.

5. International Evidence

Thus far, we have examined the impact of commercial banks as underwriters in the United States. However, there is some international evidence on differences between the ex ante pricing and ex post performance of commercial bank and investment bank-underwritten issues, additional analyses on the extent to which commercial banking relationships affect the choice of underwriter, and evidence on other potential conflicts of interest. Below, we survey the literature related to commercial bank underwriting in Japan, Canada, and Israel.

5.1. Japan

Japan and the United States have similar regulatory histories regarding the ability of commercial banks to underwrite securities. In Japan, commercial banks were allowed to underwrite securities until 1948. However, much like the Glass-Steagall Act in the United States, Article 65 of the Securities and Exchange Act of 1948 effectively prohibited commercial banks from running securities businesses. The Financial System Reform Act of 1992, which

came into effect in 1993, allowed commercial banks to again underwrite securities through subsidiaries, and in a short period of time, commercial banks gained significant market share in corporate bond underwriting.[20] Despite the similarities in their regulatory histories, as opposed to banks in the United States, Japanese commercial banks have historically operated in a main bank system where banking relationships are strong and long-term.[21] Therefore, the trade-offs between conflicts of interest and certification should be pronounced in Japan, and there is likely to be a strong impact of existing banking relationships on competition for issuers in the underwriting markets.

Konishi (2002) examines the pricing and long-term default performance of industrial bonds underwritten by commercial banks as compared with investment banks during the pre-war period in Japan (January 1919 – December 1927). Using the same framework as in Puri (1996) to examine ex-ante pricing, the author finds no difference in the yields of commercial bank-underwritten and investment bank-underwritten bonds, consistent with conflicts of interest not dominating the certification effect. To examine long-term default performance, Konishi (2002) follows Puri (1994) and calculates cumulative mortality rates as well as uses a probit model to estimate if the probability of default is influenced by bank underwriting, after controlling for other important factors. The results of the mortality analysis indicate that commercial bank-underwritten issues default significantly less often than investment bank issues at time horizons from three to seven years after issuance. Further, the probit analysis of default probability also shows that commercial bank issues are significantly less likely to default. Together, these results suggest that conflicts of interest were not a problem when banks underwrote public securities in pre-war Japan, which is consistent with the evidence from the pre-Glass-Steagall period in the United States.

There are three papers that study the pricing of industrial bonds in Japan after the Financial Systems Reform Act, comparing commercial bank and investment bank issues. In each of these papers, the authors identify if the underwriter has an outstanding loan to the issuer and also if the underwriter owns shares in the firm. As in Gande et al. (1997), Roten and Mullineaux (2002), and Benzoni and Schenone (2004), the identification of these prior

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[20] See Hoshi and Kashyap (1999) for more details on financial deregulation in Japan and its consequences.
[21] See Hoshi (1996) for a discussion of main bank relationships and universal banking in Japan.

relationships allows for a richer testing ground. These papers are by Hamao and Hoshi (2002), Takaoka and McKenzie (2006) and Liu and Kang (2004). In examining yields, Hamao and Hoshi (2002) find weak evidence for conflicts of interest, Takaoka and McKenzie (2006) find weak evidence of certification, and Liu and Kang (2004) find no evidence of conflicts of interest in terms of differential effects between commercial banks and investment banks. Takaoka and McKenzie (2006) additionally examine if bank entry post-1993 lowered commissions and yields, and they find some supporting evidence. Each of these papers has slightly different samples and methodology. Clearly more research is needed here to answer this question.

Yasuda (2004) also examines the Japanese bond market after the Financial Systems Reform Act but focuses on the effect of bank relationships on competition in the underwriting market. Using a framework similar to Yasuda (2005), the author estimates a joint model of the gross spread and the firm's selection of underwriter, allowing the firm to choose between fifteen underwriters. The estimates indicate that having a prior lending relationship significantly increases the probability of being selected as bond underwriter, and stronger lending relationships increase the likelihood of selection by more than weaker relationships. This is consistent with the evidence from the United States. In addition, issuers are willing to pay a higher fee (+0.513%) for underwriting services from banks with which they have pre-existing lending relationships, all else equal. This suggests that banking relationships provide additional value to the firm. Interestingly, the results in Yasuda (2005) indicate that issuers in the United States are willing to pay 1.238% more to use a relationship commercial bank as underwriter, which provides some indication that there could be more benefits in the United States from issuers using a relationship bank as underwriter.

5.2. Canada

In Canada, universal banking began after deregulation occurred in 1987. Within thirteen months after the June 1987 change in law permitting bank entry, all six of Canada's chartered banks had an underwriting division. The commercial banks gained significant market share during the following years. Ursel and Ljucovic (1998) examine the relationship between commercial bank underwriting (as modeled by a dummy variable that indicates if the underwriter is bank-owned) and underpricing using a data set of 111 Canadian IPOs between July 1987 and

December 1994. The authors are limited by data constraints that prevent them from tracking existing lending relationships between banks and firms, which would enable stronger conclusions. Using a parsimonious specification, the authors find that commercial bank-underwritten issues have lower underpricing, but after controlling for other important factors, such as reputation, Ursel and Ljucovic (1998) no longer find a significant difference.

Hebb and Fraser (2002) examine the relationship between commercial bank underwriting and bond yields using 356 non-convertible bond issues from 1987 to 1997. The authors find that commercial bank underwritten issues have a yield that is lower by 20 basis points, consistent with commercial banks being net certifiers. For the issues where the authors are able to identify the issuer's primary lender they find that the existence of a lending relationship does not affect bond yield spreads. The Canadian data from both the equity and debt markets suggest that conflicts of interest are limited by commercial banks certification ability.

5.3. Israel

In Israel, banks are highly universal in nature, managing investment funds and controlling underwriting affiliates. The close links between the investment fund and the bank allow for researchers to examine this potential source of conflicts of interest. Ber, Yafeh, and Yosha (2001) perform such an analysis, examining if conflicts of interest are present when banks underwrite Israeli IPOs. In this study, the authors gather data on 128 IPOs of manufacturing firms from 1991 to 1994. For each of the issues, the authors identify if the firm has a prior lending relationship with the underwriter and if the bank's investment fund purchases the firm's stock at the time of the offering and in the aftermarket. Ber et al. (2001) examine the effect of these relationships on the accounting and stock performance for one year following the issue as well as the underpricing of the issue. In terms of accounting profitability, the authors find that firms that are underwritten by bank lenders significantly outperform other issuers. Further, they find that these better performing firms were similar ex ante to other IPO firms based on publicly available information, indicating that banks underwrite superior firms. This is inconsistent with the existence of conflicts of interest. However, when the authors examine the long run stock performance, their results indicate that the stocks of firms with a bank underwriter-lender exhibit significantly negative excess returns during the first year that are significantly different than the

excess of returns of firms that do not have a bank lender-underwriter.[22] Also, an examination of first day returns reveals that issues involving a bank lender-underwriter are significantly overpriced. How can the strong accounting performance and poor stock performance be reconciled? The authors find that much of the poor stock performance comes from issues where the bank's fund management division made significant purchases. Ber et al. (2001) conclude that the results indicate a conflict of interest, as banks overpriced these IPOs, favoring the IPO client firms at the expense of investors in the bank's investment fund.

6. The Indirect Role of Commercial Banks on Capital Markets

Throughout this article, we have documented that the empirical literature has generally found commercial banks to be certifiers of firm value when they combine lending and underwriting activities. However, even if banks cannot directly participate in capital markets through underwriting, banks' actions and lending decisions might still affect outside stakeholders in firms. Can banks, which have private information about a firm's prospects, signal the quality of firms to outside investors through their lending decisions? Fama (1985) and Diamond (1991) provide theoretical analyses of these questions. Fama (1985) claims that banks are "special" with respect to other financial intermediaries in their ability to gather and process private information and their ability to certify firm value to outsiders.[23] His argument relies on two important observations. First, bank borrowers are usually depositors at the bank, which creates an information advantage for banks relative to other financial intermediaries because they have access to private information provided by the ongoing history of bank deposits. The deposit record makes it cheaper for banks to monitor and screen potential borrowers. Second, bank loans are generally low priority claims, so the granting and renewal of bank loans provides positive signals to higher priority lenders, allowing these higher priority lenders to avoid monitoring the firm. Therefore, bank loans reduce the need for outsiders to generate duplicate information, allowing bank loans to reduce overall information costs. Since outsiders use the

[22] The authors use a market model approach and compare the excess returns for each firm for the first year after IPO.
[23] In addition to Fama (1985), many theoretical models, such as Diamond (1984), Ramakrishnan and Thakor (1984), and Boyd and Prescott (1986), highlight that banks are comparatively advantaged over capital market participants in screening and monitoring corporate borrowers. See Meyer and Vives (1993) for a comprehensive survey.

bank loans as positive signals of firm value, according to this analysis, bank loans are important conveyers of private information to the capital markets.

Building on insights in Fama (1985), Diamond (1991) develops a model in which banks have a comparative advantage relative to capital markets in funding younger, smaller and less well-known firms due to their ability to screen and monitor borrowers. Through ongoing lending relationships in which the bank monitors the firm, young firms can develop a credit record to obtain a sound reputation. The acquisition of reputation allows the firm to access the public debt markets later in the "life-cycle." In this model, the banks' superior access to private information from screening and monitoring activities allows the bank to convey information about borrower quality and signal creditworthiness to the capital markets.

The analyses in Fama (1985) and Diamond (1991) highlight banks' role as information producers. One implication of these studies is that if the private information gathered in the lending process provides banks with a comparative advantage over other intermediaries and allows firms to build a reputation, then the granting and renewal of bank loans will provide a positive signal to outside investors of the bank's private information, particularly when borrowers are young and informationally-opaque. Conversely, the selling of loans may be a negative signal. In Section 6.1., we survey the empirical studies that test this claim by examining the borrowing firm's stock price response to bank loan announcements, renewals, and sales. Another implication of the analyses in Fama (1985) and Diamond (1991) is that by conveying private information to the market through lending decisions, bank loans reduce the need for outsiders to generate duplicate information and reduce information asymmetries between firms and outside markets. Therefore, even if the bank cannot underwrite the firm's public securities, the existence of a bank loan may result in higher security prices. In Section 6.2., we summarize the empirical evidence on the effects of bank loans from non-underwriting banks on the pricing of public security offerings.

6.1. Market Reaction to Loan Announcements, Renewals, and Sales

If the announcement of bank loans conveys positive private information to investors, then the borrowing firm should realize an abnormal return around the event date. James (1987) provides the first in-depth analysis of the impact of bank loan announcements on a firm's equity

returns, as he compares the abnormal returns associated with bank loan announcements with the returns generated by announcements of other financings.[24] James (1987) selects 300 companies at random from the Center for Research on Security Prices (CRSP) daily return files and searches the *Wall Street Journal Index* for announcements of public straight debt offerings, private placements of debt, and bank borrowing agreements over the period 1974-1983. The bank loan agreements consist of new credit agreements and the expansion of existing agreements. In total, James (1987) finds 207 financing announcements, which are comprised of 80 bank loan agreements, 37 private placements (which are primarily arranged by insurance companies), and 90 public straight debt offerings.[25] He uses a market model to obtain estimates of abnormal stock returns around the announcement of the financing events. Using two-day announcement period abnormal returns, James (1987) finds that bank loan agreements produce an abnormal return of +1.93%, which is significant at the one percent level. In contrast, the author finds that announcements of public debt offerings produce a statistically insignificant abnormal return of –0.11%, and private placements produce an average abnormal return of –0.91%, which is significant at the ten percent level. The positive reaction to bank loan agreements and the negative reaction to the other financings, which are not arranged by commercial banks, suggest that there is some benefit to the intermediation process provided by commercial banks and bank loans. However, since the abnormal returns may be driven by differences in the characteristics of the issues rather than the special nature of bank lending, James (1987) further refines his tests by grouping the types of announcements based on the purpose of the financing, the maturity of the issuances, the debt rating of the issuer, and the size of the borrower. His analysis indicates that differences in the abnormal performance are not driven by these characteristics, strengthening the view that bank loan agreements signal the bank's positive private information about a firm's prospects to the capital markets.

Building on James (1987), Lummer and McConnell (1989) make an important distinction between new bank credit agreements and revisions to already existing credit agreements. If the announcement effects are significant for new bank credit agreements, then this suggests that

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[24] Mikkelson and Partch (1986) first discovered that bank credit line announcements cause abnormal returns, but this analysis was a small aspect of their study.

[25] In James (1987) and future studies that examine announcement effects, the authors take great care to remove any announcements that are potentially "contaminated" by other news information, such as dividend declarations, earnings announcements, or other financings.

banks can transmit private information to the capital markets at the outset of a loan agreement due to the initial screening of the client. However, if announcement effects are pronounced among loan renewals and revisions, then this suggests that banks are able to convey private information from their ongoing monitoring activities to capital markets. To construct their sample, Lummer and McConnell (1989) search the *Wall Street Journal Index* for announcements of credit agreements involving commercial banks and U.S. corporations covered by CRSP for the period 1976 to 1986, and they find 728 announcements that meet their criteria. Of the 728 announcements, 371 are new credit agreements and 357 concern existing agreements. Using the same methodology employed by James (1987), the authors employ an event-time study of stock returns over the two-day period encompassing the announcement day in the *Wall Street Journal* and the previous day. Consistent with James (1987), the authors find an announcement-period excess return of +0.61%, which is significant at the one percent level. Importantly, the authors find that the positive abnormal return is driven by revised credit agreements, which produce a highly significant positive abnormal return of +1.24%. In contrast, the sample of new credit agreements produces a statistically insignificant announcement-period excess return of –0.01%. Further, favorable revisions produce positive abnormal returns while negative revisions and cancellations that are initiated by the lender produce strongly negative announcement-period excess returns. Importantly, the results hold up when the authors use multivariate regression models that control for other characteristics of loan initiations and renewals that could be driving the results, such as the sizes, maturity, secured status, and structure of the contract. Overall, these results support the view that the private information that banks transmit to the capital markets arises from the monitoring activities of the bank that take place over the course of an ongoing relationship rather than from the screening of the borrower during a loan initiation.

An empirical study by Slovin, Johnson, and Glascock (1992) examines if announcement effects differ by the size of the firm. Based on insights in Diamond's (1991) model, the authors claim that since there is more information available for larger firms rather than smaller firms, banks do not have to provide as intense screening and monitoring services for larger borrowers. Therefore, if announcement day abnormal returns reflect a bank's private information that is gathered through screening and monitoring, then bank loan announcement effects should decrease in firm size. To test the hypothesis, Slovin et al. (1992) classify the sample firms into small and large based on the median market value of equity of all listed CRSP firms in the year

of a given announcement. A search of the *Wall Street Journal Index* over 1980 to 1986 produces 273 favorable loan announcements, of which 156 are for small firms and 117 are for large firms. The results indicate a statistically insignificant reaction to large firm loan announcements (+0.48%, z-statistic = 1.58), but a large positive abnormal return for small firm loan announcements (+1.92%, z = 5.35). Furthermore, for small firms, both initiations and renewals produce positive abnormal returns, while for large firms, neither initiations nor renewals have significant announcement period excess returns. These results, which are robust to a multivariate specification, support the view that banks gather more private information when screening and monitoring small firms rather than large firms.

Best and Zhang (1993) also examine the information content of bank loan agreements. The authors claim that if there are reliably accurate public signals of firm value, then bank loan announcements should convey little additional information to the market. Alternatively, in cases where public signals are noisy, then the information content of bank loans should be pronounced. To examine this possibility, the authors split their sample according to whether financial analysts' percentage earnings prediction errors during the year prior to the announcement are high or low. The results, which are based on 491 usable loan announcements over the period 1977 to 1989, indicate that announcement day excess returns are significant for the high prediction error sample (+0.6031%, z=2.99) but not for the low prediction error sample (+0.0444%, z=0.28). These findings indicate that bank's private information is valuable when public information is unclear. The authors also examine if there is evidence consistent with the view that banks expend more effort to monitor firms when public signals indicate that a firm's prospects have changed. To do so, Best and Zhang (1993) test if abnormal returns differ if the most recent earnings forecast revisions are positive, unchanged, or negative. The authors find that for firms that receive positive earnings forecast revisions, loan announcement abnormal returns are insignificant, but for firms who receive negative earnings forecast revisions and have noisy forecasts of earnings, loan announcements produce significant abnormal returns. All of the results withstand a multivariate specification that allows the authors to control for other factors that could influence abnormal returns. One interpretation of the results is that banks do little further monitoring and screening when public signals are reliable and positive, but when public signals are noisy and firms prospects change for the worse, banks expend additional effort on monitoring.

In another study, Billett, Flannery, and Garfinkel (1995) examine if the lender's identity affects the announcement day abnormal returns. The key motivation for this breakdown is that loan announcements from higher-quality lenders, who could have better monitoring abilities, may be more informative to outsiders than loan announcements from lower-quality lenders. To examine if lender identity matters, the authors examine if a bank's credit rating causes differences in the announcement day abnormal returns. Billett et al. (1995) search Dow Jones News Retrieval Service for the time period 1980 to 1989 and find 626 useable loan announcements. Using the same basic methodology as in previous studies, the authors find that loan announcements where the lender is a high-quality lender (rated AAA) produce a significantly positive abnormal return of +0.320%, while loans from low-quality lenders (rated BAA or below) are negative (-0.233%) and statistically insignificant.[26] Further, mean abnormal returns for loans from AAA lenders significantly exceed the excess returns from lenders rated BAA or lower. While the univariate results indicate that the announcement effects are concentrated among loans from high-quality lenders, as in previous studies, the authors refine their test through regressions that control for other characteristics that could be driving the result (such as differences in borrower characteristics). Even after controlling for these other factors, higher quality lenders continue to be associated with significantly higher abnormal announcement returns.

Overall, these studies find that the announcement day abnormal returns are significantly positive for loan announcements, stronger for loan renewals and changes rather than initiations, larger for smaller firms rather than larger firms, stronger when public information about the firm is noisy rather than clear, and larger for higher quality lenders. It is important to note that the positive abnormal returns around loan announcements contrasts with the strongly negative announcement effects of equity, the moderately negative abnormal returns around convertible debt issuance, and the insignificant abnormal returns surrounding straight public debt announcements (see Asquith and Mullins (1986), Mikkelson and Partch (1986), and Masulis and Korwar (1986) for equity issuances; Eckbo (1986) and Mikkelson and Partch (1986) for debt

[26] One difference between Billett et al. (1995) and the previous papers is that this study uses one-day event windows because the authors are able to identify if the announcement occurred during the trading day. The data used in previous studies does not allow for the authors to distinguish announcements that occur during or after the trading day, which forces the use of two-day event windows.

issuances). These latter results are consistent with a firm's public security issuance decision revealing its private information on its prospects (Myers and Majluf (1984)) and strengthen the view that bank loan announcements convey positive private information to the capital markets.[27]

To further examine the information content of loans, Dahiya, Puri, and Saunders (2003) take a different approach and study the announcement of a *sale* of a borrower's loans by its lending bank. The termination of a banking relationship through a loan sale may convey a negative signal to the market about a firm's prospects. To test this hypothesis, the authors employ the event-study methodology, using a sample of loan sale announcements by the originating bank for sub-par loans. The data is collected by cross-matching loan sale information in two market newsletters (*Gold Sheets* and *Bank Letter*) with CRSP.[28] Using 3-day, 5-day, and 7-day event windows, the authors find a highly significant negative abnormal return of between –1.61% and –8.11%. These results are consistent with a negative information effect arising from loan sales. The authors also perform two additional tests to examine if loan sales are valid signals of a bank's negative private information about the firm. First, the authors find that firms that have their loans sold are more likely to file for bankruptcy than other comparable firms and firms that are performing poorly.[29] Second, the authors find that firms that have their loans sold are not the worst performers in their respective industries during the year before their loan was sold, indicating that ex-ante, publicly available information alone may not have allowed outsiders to identify the true weakness of these firms. These results support the view that loan sales by the original lender provide negative private information to outside investors.

6.2. Non Underwriter-Bank Loans and Public Security Pricing

In addition to conveying private information to the market through announcements and sales, the analysis in Fama (1985) and Diamond (1991) indicates that bank loans reduce the need

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[27] See however, some contrary evidence in Billet, Flannery and Garfinkel (2003) who find in the long run, bank loan announcements appear no different from seasoned equity or public debt issuance. Thus the positive abnormal return is subsequently followed by a negative return.

[28] Dahiya et al. (2003) focus on the sales of seasoned sub-par loans, where the information effects of bank sales are likely to be highest and where they have a more representative sample of loan sales.

[29] For this test, the authors are able to expand their sample to 53 firms what have a sub-par loan sold. They were forced to use the smaller sample of 15 loan sales in the event-study due to missing information on the precise date of sale.

for outsiders to generate duplicate information. This may allow bank lending to reduce overall information costs. Further, bank loans can help resolve information asymmetries between management and outside investors that could induce managers to refrain from issuing equity and foregoing positive net present value investments (Myers and Majluf (1984)). One way to test if bank loans reduce information-related costs is to empirically examine the impact of existing loans on the pricing of a firm's public security issuance. If bank loans reduce information costs, then the existence of bank loans should result in higher security pricing.

James and Weir (1990) investigate how an established relationship with a bank affects IPO underpricing. The authors develop a theoretical model that predicts that due to the information benefits of having an existing lending relationship, firms with an established lending relationship will experience less severe underpricing when they go public. To test the model, the authors collect a sample of 549 IPOs for non-financial firms that occurred between 1980 and 1983 and identify 417 firms with existing bank borrowing relationships. After controlling for factors that have been identified to affect underpricing (i.e. the reputation of the underwriter, the age of the firm, the offering size, and the shares offered by insiders), having bank loans outstanding or a bank-credit agreement significantly reduces underpricing by 8.5 percent. This result suggests that bank loans reduce the information costs associated with issuing public securities.[30]

In addition to having a positive effect on equity issuances, existing lending relationships may also reduce the costs of public debt financings. Datta, Iskandar-Datta, and Patel (1999) examine this possibility. The authors argue that if banks have superior monitoring ability, then the presence of a bank lending relationship should lower information costs associated with raising public debt, which will be reflected through a lower at-issue yield spread (higher price) of a firm's first public debt issuance. The authors focus on first debt issuances because firms issuing seasoned debt are already monitored by public debtholders, which can make it difficult to distinguish if the private banking relationship drives any results. Further, first public debt offers are undertaken by younger and smaller firms, where asymmetric information is likely to be high. Datta et al. (1999) collect a sample of 98 initial public offerings of straight debt that occurred

[30] However, the authors do not find a statistically significant difference between bank loans and long term debt, which does not support the hypothesis that bank loans play a special role in reducing information costs for IPOs.

between 1971 and 1994 and determine that 64 firms have bank debt at the time of public issuance. In their main specification, after controlling for firm and bond characteristics, as well as differences in risk, the authors find that the existence of a bank lending relationship during the year prior to the public debt issuance reduces the at-issue yield spread of the first public bond offering by 84 basis points.[31]

The findings in these two papers support the view that the existence of a bank relationship reduces the information costs of accessing the public equity and debt markets. The results are consistent with bank lending agreements being valuable because the existence of a banking relationship increases a firm's public security prices. These findings complement the evidence on the market's reaction to loan announcements, renewals, and sales in that they emphasize the importance of the information content of bank loans.

7. Extensions

Thus far, we have confined ourselves to the interaction of banks and capital markets. There are, of course, many interesting and important areas in banking and financial intermediation that are not directly related to the direct focus of this survey, but where additional research is needed.[32] Some of these areas are mentioned here.

7.1. Banks as Equity Holders

An area where banks might expand their activities but traditionally have not been allowed to, at least in the U.S., is in holding equity stakes. As opposed to Japan and Germany, where banks are allowed to hold equity, banks in the U.S. are allowed to hold equity only though restructuring bad loans (see e.g., James (1995)), or through some provisions in venture capital

[31] The results in Datta et al. (1999) are somewhat mixed. In another specification, they find a significantly *positive* relationship between a banking relationship and the at-issue yield spread when they only control for firm characteristics and if the bond has a call provision. The negative relationship arises once the authors control for subordination and covenants.

[32] For an excellent survey of many of the other areas in financial intermediation not covered here, see Gorton and Winton (2002).

(see e.g., Hellmann, Puri, and Lindsey (2004)).[33] As previously noted, there are efficiencies from underwriters holding equity in firms; venture capitalists as equity holders reduce IPO underpricing when they underwrite and, further, gross spreads on IPOs decrease in the underwriters' shareholdings of the firm (Li and Masulius (2004)).

Why and when do banks choose to invest in equity, and what are the implications for the firm? There is surprisingly little research on this issue. Hellmann et al. (2004) explore this topic by focusing on the impact of bank venture capital relationships on the bank's core lending division. Venture relationships may allow the bank to foster an ongoing lending relationship. Also, the private information from the venture relationship may reduce the bank's cost of lending due to informational economies of scope, allowing firms to benefit from lower loan yield spreads. To examine these issues, the authors collect detailed information on all venture capital investments for the period 1980 through 2000 and gather lending data for the 10,583 venture backed customers. To examine if venture relationships increase the likelihood that the bank investor will forge a lending relationship with the firm, the authors estimate a conditional logit model in which each firm can choose among banks. The results reveal that the venture relationship does indeed increase the likelihood of being selected as lender, even after controlling for the bank's share of the lending market and the firm's public status. These results are confirmed through another test at the aggregate level in which the authors find that banks are more likely, on average, to lend to companies with whom they have a prior venture relationship.

To examine loan pricing, Hellmann et al. (2004) match loans where the lender has a prior venture relationship with the firm ("relationship loans") with similar loans where no venture relationship exists ("non-relationship loans") and compare the yield spreads of the matched loans. Since it is difficult to match loans directly based on multiple relevant characteristics, the authors use propensity score matching, which reduces the multiple-dimension matching problem

[33] The advantages and disadvantages of allowing banks to hold equity have been analyzed in a number of models (see, e.g., Berlin, John and Saunders (1996), Stiglitz (1985), Winton (2003)). Empirical work on bank control rights through board seats and equity holding is found in Germany by Gorton and Schmid (2000), who find that banks use their equity holding and board seats to improve firm performance. For Japan, Kaplan and Minton (1994) find banks are more likely to get board seats following poor firm performance, and Weinstein and Yafeh (1998) and Morck, Nakamura and Shivdasani (2000) find that Japanese firms with a main bank have lower growth and profitability than others.

to a single-dimension, called the propensity score.[34] These methods take into account the fact that the characteristics of relationship loans may differ significantly from non-relationship loans and ensure that such observed characteristics are not driving the results. Using various estimators, the authors find that relationship loans have significantly lower yield spreads, by 18 to 26 basis points. In sum, the results suggest that as venture capitalists, banks tend to be strategic investors in equity and use venture capital relationships to foster a lending relationship that results in efficiencies that benefit both banks and firms. The results highlight the impact of organizational form on the incentives and behavior of investors. This is an area worthy of more study.

7.2. Beyond Screening and Monitoring

The central idea behind much of the banking literature is that banks have access to private information about the firm. The bank's ability to generate information has implications on the firm's financing decision. Can banks play other roles for firms that go beyond screening and monitoring? In studies of venture capitalists, there is some evidence that venture capitalists do not simply screen and monitor but also help provide costly effort in the form of support activities for the firm. When financing the firm, venture capitalists expect to help the founder professionalize the company (Kaplan and Stromberg (2001, 2004)). Also, firms financed by venture capitalists are more likely to professionalize early and are more likely to get their product to market (Hellmann and Puri (2000, 2002)). Lerner (1995), Baker and Gompers (2003), and Hochberg (2004) find that venture capitalists play an important role in determining the composition of the board of directors. Lindsey (2004) finds some evidence that venture capitalists facilitate strategic alliances of firms within their portfolio. Of course, one could argue that the main difference between banks and venture capitalists is that banks typically provide only debt financing while venture capitalists have equity-based contracts. However, in many countries around the world, banks are not prohibited from taking equity stakes. Yet, other than

[34] To employ the methodology, the authors first run a probit model, where the dependent variable is one if the loan is a relationship loan and zero otherwise, and the independent variables are the matching dimensions, which include loan and borrower characteristics. Each loan is assigned a propensity score, which is their predicted probability from the probit model. See Heckman, Ichimura, and Todd (1997, 1998) for more details. This method of matching loans is also used in Drucker and Puri (2005).

some evidence on banks' role on boards of directors (see e.g. Kroszner and Strahan (2001)), we have little evidence that banks play a support role for their borrowers. Is there limited evidence because banks do not provide these services or simply because this possibility has not been explored by researchers? Again, this is an area where more research is warranted.

7.3. Loan Sales

The loan sales market is rapidly growing, and loans sales are a major source of funding for banks and a way for banks to manage risk.[35] While a number of studies have formed and tested theories of the loan sales market, a consensus has not been reached on the functioning of this very important market. We summarize the literature on the two prevailing information-based theories of loan sales – the "monitoring technology hypothesis," and the "comparative advantage hypothesis."[36]

Berger and Udell (1993) develop the "monitoring technology hypothesis," which attempts to explain loan sales as a reaction to improvements in monitoring and information technology.[37] As information technology improves, banks can sell loans to direct lenders because these loan buyers increase their ability to monitor loans. For high quality borrowers, the monitoring cost advantage of banks falls below the signaling costs of intermediation, which enables the sale of loans. An important implication of the theory is that banks keep risky, essentially illiquid loans for which their monitoring advantage is important. Berger and Udell (1993) find empirical support.

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[35] See Gorton and Haubrich (1990) for early evidence on loan sales and Yago and McCarthy (2004) and Thomas and Wang (2004) for more recent developments in the loan sales market.
See Gorton and Haubrich (1990) for empirical evidence on loan sales market size and trends.

[36] Berger and Udell (1993) provide details on nine competing theories. Non-information based theories include the "diversification hypothesis," which claims that loan sales provide a way for banks with limited opportunities to diversify their loan portfolio (Demsetz (1999), Haubrich and Thomson (1996), Pavel and Phillis (1987)), the "regulatory tax hypothesis," which suggests that regulatory taxes on on-balance sheet activities result in banks using off-balance sheet activities, such as loan sales (Pennacchi (1988), Pavel and Phillis (1987)), the "collateralization hypothesis," in which loan sales provide a mechanism to shift risk from risk-averse to risk-neutral investors (Benveniste and Berger (1986, 1987)) or to help avoid debt overhang for banks (James (1988)), and the "moral hazard hypothesis," which suggests that banks use loan sales to book income immediately and increase leverage to take advantage of deposit insurance (Benveniste and Berger (1986), James (1988)).

[37] This theory is an extension of Bhattacharya and Thakor (1993), who find that intermediary monitoring dominates direct monitoring when the benefits from scale economies in monitoring exceed the costs of signaling the value of assets to investors.

The "comparative advantage hypothesis" argues that loan sales arise out of exogenous differences in the comparative advantages of financial intermediaries. Researchers have explored a number of different comparative advantages that could motivate loan sales.[38] Hess and Smith (1994) claim that banks may have a comparative advantage in originating and servicing loans but not in funding or interest risk management. Pavel and Phillis (1987) provide empirical support, showing that banks with origination and servicing advantages have a higher probability of selling loans and also sell more loans. Carlstrom and Samolyk (1995) assume that banks have an advantage in finding and screening profitable local projects and loan sales arise because, otherwise, financially constrained banks would have to pass up positive investments when there were many good opportunities in the local market. Some empirical studies have supported this theory, as a typical bank with a binding capital constraint is more likely to sell a higher proportion of loans than an unconstrained bank (Haubrich and Thomson (1996), Pavel and Phillis (1987)), unconstrained banks are more likely to buy loans (Demsetz (2000)), and strong local origination opportunities are positively related to loan selling (Demsetz (1994), Demsetz (2000)).

7.4. Bank Organizational Form

There is a growing amount of work on the nature of information collected by banks from their clients, and on how the organizational form of the bank may be more conducive to collecting some kinds of information as opposed to others. A key empirical finding is that large banks tend to lend to large companies and small banks tend to lend to small companies (see Berger, Kashyap, and Scalise (1995), Berger, Saunders, Scalise, and Udell (1998), Berger and Udell (1996), Nakamura (1994), Peek and Rosengren (1996), Strahan and Weston (1996, 1998), Sapienza (2002)). Stein (2002) argues that the key difference between small and large business lending is that small business lending relies on "soft" information, which is information that cannot be directly verified by anyone other than the agent who produces the information. Small

[38] In addition to the information-based comparative advantages that are discussed here, Pennacchi (1988) discusses another comparative advantage that is based on funding differences between banks. Loan sales provide a means by which the inexpensive funds that are raised by some banks can be used to finance the loans at other, higher cost banks. The empirical evidence on this non-information-based view is mixed (see e.g. Berger and Udell (1993), Haubrich and Thomson (1996)).

banks are better at processing soft information while large banks are better at processing verifiable "hard" information, such as financial statements, public credit ratings, and formalized records.

Since research shows that relationships are important for small companies (see e.g. Petersen and Rajan (1994)), it is vital to understand the effects on small firms of the growth in the size of banks and the increased reliance on hard information. There are a few empirical papers that examine the role of hard and soft information in the credit decisions of banks. Liberti (2002) examines a hierarchical structure change in a corporate commercial lending division of a private foreign bank in Argentina. He finds that managers with more independence base their pricing decision more heavily on soft information than managers with more limited decision authority. Berger and Udell (1996) show that large banks do not reduce credit to small firms whose credit worthiness can be judged by examining hard information, such as their financial ratios. Another study by Cole, Goldberg and White (1999) uses the National Survey of Small Business Finances to examine the decision by banks to accept or reject credit applications by small firms. They find that larger banks make credit allocations based on standard hard information criteria, such as figures that can be obtained in financial statements. Mian (2004) finds evidence consistent with foreign banks with larger distance between their head offices and local branches avoiding informationally difficult credit, where soft information is likely to be more important. Also, Berger, Miller, Petersen, Rajan, and Stein (2005) use a sample of small business loans and find that firms with financial records borrow from banks that are larger, on average.

7.5. Bank-based vs. Market-based Economies

Many economies are largely bank-dependent and capital markets are not well developed. Are banks and stock markets substitutes? This remains an important question. There has been some theoretical work on this subject. Allen (1993) and Allen and Gale (1999) argue that banks and stock markets fundamentally differ in the way that they process information, in that banks are inherently more conservative. Thus, stock market based economies are more likely to embrace new technologies. In contrast, Dow and Gorton (1997) argue that banks and stock markets are alternative institutions for the savings/investment process. There is now growing

empirical research on bank based and stock market based systems.[39] The bulk of evidence seems to suggest that both financial intermediaries and markets matter for growth. However, the results are far from conclusive and more research is needed.

8. Concluding Remarks

There has been a large amount of research on the implications of allowing banks to expand their activities beyond traditional lending into underwriting. There is convincing evidence that, at least in the United States, commercial banks do not suffer from conflicts of interest and can be net certifiers of firm value when underwriting public securities. This is seen through the ex ante pricing and ex post performance of commercial bank-underwritten securities. The results are robust across different time periods, different securities, and the use of different empirical methodology. The international evidence on conflicts of interest from commercial bank underwriting is mixed. However, the discrepancies may be partially explained by the varying regulatory environments and quality of the financial markets in these countries. Future research will benefit from empirical tests that explicitly account for these differences.

Many empirical studies document that, in both debt and equity offerings, borrowers receive lower underwriting fees when they use their lending bank as underwriter. Both prior lending and concurrent lending increases the likelihood that the bank will win underwriting mandates. These results seem to imply that commercial banks will crowd out specialized investment banks. However, recent evidence suggests that investment banks are competing with commercial banks by developing lending units. Investment bank lending raises serious issues for regulators, yet there is limited evidence on the consequences of investment bank lending. More research is needed in this area.

Banks also play an indirect role in capital markets. Empirical studies of stock market reaction to loan initiations, renewals, and sales confirm that banks can signal the quality of firms to outside investors through their lending decisions. Additional evidence suggests that the existence of a bank lending relationship reduces the costs of information acquisition for capital market participants.

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[39] See Levine (2004) for an excellent review.

Overall, there are positive effects from the interaction between commercial banks' lending activities and the capital markets. However, banks in the U.S. are allowed to hold equity only though restructuring bad loans or through venture capital investments. Should commercial banks in the U.S. be allowed to expand their ability to hold equity holdings of firms? In general, we observe that there is some evidence of efficiencies from financial intermediaries being able to hold equity stakes. For example, when commercial banks hold equity in firms through venture capital subsidiaries, they foster an ongoing lending relationship that results in efficiencies that benefit firms through lower loan pricing. Would there be positive effects from the interaction between commercial banks' equity holdings and capital markets? When banks hold equity in firms do they provide value added services similar to those provided by venture capitalists, such as professionalization or support in the human resources area? What can we learn from examining the effects of commercial bank equity holding in other countries, such as Germany and Japan? These issues are yet unresolved and promise to be at the forefront of continued regulatory debate on the scope of bank activities.

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