

## **Universal-Bank Underwriting and Conflicts of Interest: Evidence from German Initial Public Offerings**

Peter G. Klein  
Contracting and Organizations Research Institute  
University of Missouri

Kathrin Zoeller  
Princeton, N.J.

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**Abstract:** This paper investigates conflicts of interest associated with relationship banking. Using a sample of 274 German initial public offerings (IPOs), we ask if universal-bank-underwritten IPOs perform differently from IPOs underwritten by specialized investment banks. We find that universal-bank affiliation is correlated with higher first-day returns (underpricing) but uncorrelated with long-term performance. This suggests that underpricing compensates for potential conflicts of interest. The results also suggest that preexisting bank relationships, rather than issuer characteristics, may determine the choice of underwriter.

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Corresponding author: Peter G. Klein, Contracting and Organizations Research Institute, University of Missouri, 143 Mumford Hall, Columbia MO 65211, 573-882-7008, [pklein@missouri.edu](mailto:pklein@missouri.edu).

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# **Universal-Bank Underwriting and Conflicts of Interest: Evidence from German Initial Public Offerings**

## **1. Introduction**

Recent consolidation in the financial-services industry has brought renewed interest in universal banks, financial intermediaries that perform both commercial and investment banking. In principle, universal banks can exploit economies of scope in production and consumption and can benefit from the creation of internal capital markets. By closely monitoring their portfolio companies, universal banks can also improve the quality of corporate governance (Roe, 1990). However, critics associate universal or “relationship” banking with excessive risk, moral hazard created by the expectation of government bailouts, monetary instability, the concentration of political and economic power, a lack of consumer choice and availability of credit, and other problems (Francke and Hudson, 1984; Benston, 1994). While several of these concerns have more to do with bank size than universal banking per se, financial conglomeration nonetheless raises some special concerns.

This paper examines the double role of lender and underwriter by comparing universal-bank-underwritten initial public offerings (IPOs) with IPOs underwritten by specialized banks. To investigate potential conflicts of interest between underwriters, issuers, and investors, we study 274 recent German IPOs and relate initial returns (underpricing) and secondary-market performance to the type of underwriter. German banks have traditionally been allowed to perform a wide variety of financial services, making the German banking system an excellent setting for investigating these issues. Moreover, despite the common perception that large universal banks dominate the credit sector in Germany, specialized financial institutions are also active in the German market. Until a few years ago, the German stock market was much less liquid than the U.S. market and other European markets, so empirical studies using stock-market data have only recently become feasible.

Universal-bank underwriting is unique in several ways. As both underwriter and creditor, a universal bank might try to promote a low-quality security to raise cash for its own borrower,

transferring its loan risk to uninformed investors. The universal bank might also underprice to promote its other product lines or to favor its investing depositors and asset-management subsidiaries. If investors perceive universal banks as underwriters with conflicts of interest, then lower initial prices could be compensation to investors for the potential hazards associated with the underwriter's preexisting lending relationships. Alternatively, investors might perceive universal banks as certifiers of high-quality issues, which would lead to higher initial prices.

To see if these considerations have a systematic impact on the underwriting process and pricing, we investigate the relationship between underpricing, issue and issuer characteristics, secondary-market performance of the stock, and underwriter type. If investors are naive, we expect universal-bank-underwritten securities to be associated with normal underpricing and below-average long-term performance, controlling for issue and issuer characteristics. If universal banks underprice to promote their other services, we expect lower-than-average subscription prices and normal or better-than-average long-term performance. If investors are rational and worried about conflicts of interest, we expect lower-than-average subscription prices (higher-than-average underpricing) and neutral long-term performance, *ceteris paribus*. If investors see universal banks as certifiers of high quality, we expect higher-than-average subscription prices (lower-than-average underpricing) and neutral or superior long-term stock performance.

We find that universal-bank underwriting is correlated with above-average first-day returns (underpricing), but uncorrelated with long-term performance. This suggests that underpricing compensates for potential conflicts of interest. We then ask why issuers choose underwriters who raise less cash in the initial offering and find observable issuer characteristics such as size, leverage, ownership, and industry are generally unrelated to the choice of underwriter. This suggests that unobservable issuer-specific characteristics, which could include preexisting bank relationships, determine the choice of underwriter. One possible explanation of underwriter choice is preexisting relationships combined with high switching costs. If some issuers have preexisting relationships with particular underwriters, such as a debt relationship with a universal bank, then switching costs might outweigh the cost of leaving money on the table by using the universal

bank as underwriter. Unfortunately, while we have data on the amount of issuer debt, we cannot match this debt with particular lenders, so it is difficult to test this interpretation conclusively.

The next section explores the theoretical foundations of IPO pricing and the role of universal banks. Section 3 describes our empirical approach. Section 4 presents the results, and section 5 concludes.

## **2. Underpricing and universal banking**

Ibbotson and Jaffe (1975) first rigorously documented the high initial returns (underpricing) of U.S. IPOs. Studies documenting underpricing exist today for just about any country with a stock market, and evidence suggests that underpricing is deliberate (Hunt-McCool et al., 1996). Various theories have been developed to explain persistent, deliberate underpricing. Several early papers advanced an equilibrium signaling explanation. In these models, high-quality issuers are willing to leave money on the table to signal their quality to investors (Ibbotson and Jaffe, 1975; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989). High-quality issuers are willing to underprice because they can raise additional capital in subsequent offerings; low-quality issuers must maximize their receipts from the initial offering. In a separating equilibrium, only high-quality issuers will underprice.<sup>1</sup> One problem with the signaling hypothesis is that issuers with lower-than-average underpricing perform significantly better in the long run and return to the issue market less frequently (Michaely and Shaw, 1994). It is also unclear why high-quality issuers cannot signal their attributes more cheaply, for instance by affiliating with a prestigious underwriter.

More recent explanations have focused on informational cascades, legal liability, and compensation for investors. Underpricing can initiate a cascade of buying activity, which provides free publicity for the issuer and the underwriter. A low initial price also increases the number of

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<sup>1</sup> Moreover, underpriced stocks earn particularly high trading commission because the volume of trades is greater and investors accept higher fees if they are awarded IPO stocks. Brokers and analysts therefore have a greater incentive to scrutinize the stock. Only high-quality stocks can afford to attract that kind of attention.

applications for IPO stocks, allowing the underwriter and issuer to choose the parties to whom they allot shares (Shiller, 1990; Welch, 1992; Booth and Chua, 1996; Fulghieri and Spiegel, 1993). Evidence on the benefits for the underwriter is mixed; it is uncertain whether issuers are more likely to return to the underwriter following an underpriced IPO (James, 1992; Krigman, Shaw, and Womack, 1999).

Practitioners often argue that investment bankers underprice IPOs to reduce their exposure to shareholder litigation (Tinic, 1988; Hughes and Thakor, 1992; Drake and Vetsuypens, 1993; Nanda and Yun, 1997). If an issue is difficult to price and associated with observable risks, the investment bank would be expected to detect those in its due-diligence investigation, state them clearly in the prospectus, and price appropriately. The investment bank might err on the side of caution to avoid overpricing lawsuits from shareholders. This kind of litigation is unusual in Germany, however.

Other explanations for underpricing focus on underwriter compensation. Underwriters typically receive a percentage of the capital raised in the IPO as compensation, giving them an incentive to minimize underpricing. Moreover, if they price the issue too low, the issuer might choose a different investment bank for future transactions. However, offering securities at a discount may allow the bank to save marketing costs, reap higher commissions from heavier secondary market trading, or reduce exposure to litigation (Baron, 1982; Loughran and Ritter, 1999; Beatty and Welch, 1996). Issuers may permit underwriters to reap these benefits as compensation for the favorable use of the underwriter's private information about the issuer.

High initial returns could also motivate uninformed investors to participate in bidding against better-informed investors. These returns could also be a reward to informed investors for revealing information during the bookbuilding process. Both explanations imply a positive relationship between underpricing and ex-ante uncertainty (Rock, 1986; Beatty and Ritter, 1986; Benveniste and Spindt, 1989; Michaely and Shaw, 1994). More generally, discounted subscription prices can be interpreted as up-front compensation to investors for bearing uncertainty. Beatty and Ritter (1986) provide evidence that underpricing is positively related to ex-ante issuer risk. Muscarella

and Vetsuypens (1989) investigate reverse LBOs, finding that firms that were once publicly owned, then taken private, and subsequently returned to public ownership are significantly less underpriced than typical IPOs, presumably because the issuers are relatively well known.

However, Carter and Manaster (1990) and others suggest that high-quality issuers choose prestigious underwriters to signal their low risk instead of discounting the value of the firm. Carter, Dark, and Singh (1998) find that the underperformance of IPOs relative to the market over a three-year holding period is less severe for IPOs handled by a more prestigious underwriter. The same paper, as well as Schmidt et al. (1988) and Michaely and Shaw (1994), find that issuers with high-reputation underwriters are associated with lower underpricing. Beatty and Welch (1996) also find that prestigious underwriters in the United States were associated with lower underpricing from the 1980s to the 1990s, but the pattern reverses for the early 1990s. The reversal could be driven by the emergence of younger issuing firms, consistent with the risk-compensation theory. Jain and Kini (1999) find that higher investment-banker prestige also increases the firm's survival probability. Krigman, Shaw, and Womack (1999) document that additional analyst coverage provided by the investment bank, and higher bank reputation, are determinants of issuer choice of underwriter. Underwriter reputation can thus substitute for underpricing as a means of reassuring investors.

How does universal-bank underwriting differ from underwriting by specialized investment banks? Because relationships between universal banks and firms often go back many years, possibly from the firm's first bank loan, universal banks may have information useful for underwriting that specialized underwriters do not possess. Concerns that universal banks might use such information opportunistically motivated the separation of commercial banking and securities underwriting established by the Glass-Steagall Act (Roe, 1990, 1998; Puri, 1994). A universal bank with an existing lending relationship to a firm going public could have an incentive to underwrite and promote a low-quality issue to transfer its loan risk to uninformed investors. However, it is unclear why the bank prefers this arrangement to restructuring loan repayments, or why the firm participates in this scheme because the bank stands to lose bondholders or stock-

holders (Benston, 1994). Moreover, if universal banks were suspected of exploiting such conflicts of interest, rational investors could abstain from buying universal-bank-underwritten issues or require an appropriate risk premium.

A universal bank might also give bank loans at favorable rates to third-party investors in the understanding that they will buy securities in the IPO. This form of cross-subsidization between the departments of the bank can increase the risk of the bank and harm depositors. The bank might also be inclined to make imprudent loans to issuers to avoid the impression that it performed insufficient due-diligence investigations before the IPO and to avoid litigation from shareholders. Still, it is unclear why the market would not resolve these conflicts by tying executive compensation to the profit of the bank, imposing internal control mechanisms, relying on third-party monitoring mechanisms, or establishing self-regulating institutions. Moreover, competition among issuers and the bank's desire to maintain a reputation for trustworthiness (particularly in the face of disclosure requirements) are likely to constrain such opportunistic behavior (Minsky, 1996).

Several sequential models explore the reputation effects that mitigate the conflicts of interest present in any agency conflict, and especially in banking (John and Nachman, 1985; Diamond, 1989). Bank reputation evolves endogenously and provides an incentive to behave in the best interest of investors and issuers. Chemmanur and Fulghieri (1994a, 1994b) demonstrate that investment-bank credibility depends on their equity-marketing history. They also demonstrate that commercial banks' desire to acquire and maintain a reputation for reliability provides an incentive to invest heavily in client evaluations.

Ultimately, the bank will set the prices needed to sell to investors. Investors might be more inclined to buy universal-bank-underwritten securities if the bank uses information acquired from existing relationships to certify securities issues and to resolve informationally induced standoffs between insiders and outside investors (Akerlof, 1970; Diamond, 1984). This implies lower-than-average underpricing. On the other hand, investors might be less inclined to buy universal-bank underwritten securities if they suspect agency problems because the universal bank

is involved as a first party (Allen and Faulhaber, 1989). This would imply higher-than-average underpricing.

Gande et al. (1997) find some evidence for certification when they compare debt securities underwritten by Section 20 subsidiaries of bank holding companies to those underwritten by investment houses. They find evidence of a net certification effect for bank holding companies: compared with specialized investment banks, holding-company subsidiaries set abnormally high subscription prices for risky firms that receive loans from the bank. Gande et al. also find no evidence of conflicts of interest even when an issue is used to repay bank debt. As they explain, however, the issues of the two different types of underwriters differ greatly in size and might not be comparable. Also, the selection of banks that provide the underwriting services under section 20 is not completely random since those banks are large, reputable banks with distinct brand recognition.

Empirical studies of U.S. universal banking in the pre-Glass-Steagall period find mixed results on the effects of universal-bank underwriting. Kroszner and Rajan (1994) compare the ex-post performance of securities underwritten by commercial banks and nonbank investment houses, finding no evidence that commercial banks systematically fooled the public securities markets. Instead, there is some evidence that the markets have rationally discounted for potential conflicts associated with universal banking. Ang and Richardson (1998) confirm this result. Puri (1994) studies long-term default performance of bank-underwritten issues as compared to non-bank-underwritten issues before 1933, finding that bank-underwritten issues defaulted less than non-bank underwritten issues. Puri (1996) examines the pricing of bank-underwritten and non-bank-underwritten securities, finding that investors were willing to pay higher prices for securities underwritten by banks rather than investment houses. A comparison of in-house investment departments and affiliated outside investment banks does not indicate greater conflicts of interest for the in-house underwriters. Kroszner and Rajan (1997), by contrast, find that in-house departments underwrote seemingly higher-quality securities than did comparable affiliates, but ob-

tained lower prices for the issues they underwrote, indicating that rational investors required a risk premium.

Gompers and Lerner (1999) investigate contemporary underwriter affiliation with venture capital firms—a situation partly analogous to universal banking—and find evidence of a discount related to those affiliations. Ber, Yafeh, and Yosha (2000) investigate 128 Israeli IPOs. They compare IPOs with and without a significant loan relationship between underwriter and issuer the year prior to the IPO. The issuers with a lending relationship to the underwriter have better-than-average accounting performance following the issue, suggesting the banks picked good issuers. Surprisingly, however, the stock performance of these IPOs is below average. Hamao and Hoshi (2000) analyze the yield differentials between Japanese corporate bonds underwritten by securities firms and those underwritten by bank-owned subsidiaries, finding that investors discount bonds underwritten by bank-owned subsidiaries.

### **3. Hypotheses and data**

The foregoing discussion suggests three hypotheses relating underpricing and long-term performance to issuer, underwriter, and investor characteristics.

1. *Certification.* If investors are rational and perceive universal banks to be certifiers of high quality, we expect universal-bank-underwritten securities to have higher-than-average subscription prices (lower-than-average underpricing) and neutral or superior long-term stock performance.
2. *Naive Investor.* If investors are naive and universal banks exploit their private information to push low-quality securities, we expect universal-bank-underwritten securities to display normal underpricing and below-average long-term performance.
3. *Discount for Conflicts of Interest.* If investors are rational and worried about conflicts of interest, we expect universal-bank-underwritten securities to have lower-than-average subscription prices (higher-than-average underpricing) and neutral long-term performance.

To distinguish among the above hypotheses we investigated all 274 IPOs to the German stock market from January 1997 to December 1999. Our analysis relates the initial returns (underpricing) and the secondary-markets returns to the type of underwriter and a set of issuer char-

acteristics. The German banking system is an excellent setting for this comparison because it has traditionally permitted any financial services to be carried out by banks. Moreover, despite the common perception that large universal banks dominate the German credit sector, specialized financial institutions are also active in the German market. Until recently, corporations, banks, and insurance companies owned most German equities; consequently, there was a very small market for IPOs. The market has recently become much more liquid, however, as reflected in the unprecedented 274 IPOs during this three-year period.

The German stock exchange (Deutsche Börse AG) publishes information on issue dates, subscription prices, first-day-closing prices, issuer industry, issuer revenue, lead underwriters, secondary market prices, and venture capital investments. All other information about the issuers, including the distribution of debt, has been collected from the issuers' prospectuses.

After a careful review of each underwriter's product offerings we classify a bank as a universal bank if it performs both commercial and investment banking. In recent years the demand for investment-banking services has prompted a number of banks to advertise themselves as specialists in this area. However, we designate a bank as a specialized investment bank only if the primary SIC code of the institution indicates investment-banking services, the balance sheet of the underwriter indicates no income from lending business, and the bank's self-description suggests that it does not have commercial- or retail-banking subsidiaries. With these criteria, we designate 20 percent of the IPOs in our sample as being underwritten by specialized banks.<sup>2</sup> Table 1 lists the 52 banks involved with IPOs during our sample period. Several banks underwrote only one IPO; Deutsche Bank, the most active bank in the sample, underwrote 32.<sup>3</sup>

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<sup>2</sup> Conflicts of interest may arise if any of these criteria are violated. We considered two alternative approaches to classifying the relationship between issuer and underwriter: (1) gathering data on the value and duration of each preexisting lending relationship, and (2) computing the ratio of interest income to noninterest (fee-based) income for each underwriter and using a cut-off point to distinguish between specialized and diversified banks. Neither alternative, in our view, captures the potential for conflicts of interest as well as the definition described in the text.

<sup>3</sup> Unfortunately, we cannot determine the precise lending relationship between the commercial-banking subsidiaries of the universal banks and the IPO clients. In other words, an investment-banking subsidiary could be underwriting securities for firms that have no preexisting lending relationships with the bank's commercial-banking subsidiary. Because these relationships are also unknown to investors, we assume that rational investors will suspect the possibility of conflicts of interests when the underwriter is a universal bank.

[Table 1 about here]

Underpricing is defined as the difference between the first-day closing price and the subscription price as a percentage of the subscription price. Secondary-market performance is measured in two ways: first, as the difference of the price recorded on trading day  $T$  and the subscription price, all divided by the subscription price, and second, as the difference between the price recorded on  $T$  and the closing price on the first trading day, all divided by the first-day closing price. Although the time since IPO of course varies among the securities in our sample, we use a uniform ending day for computing long-term returns to avoid the need for purging each individual stock's returns of systematic market movements. We used two arbitrary dates for  $T$ , March 17, 2000 (shortly after the close of our three-year sample window) and August 9, 2002. Throughout the analysis we measure secondary-market performance with simple buy-and-hold returns rather than cumulative abnormal returns because the German stock market, in spite of the recent surge in IPOs, is still less liquid than the U.S. and other European markets.<sup>4</sup> To account for time- and cohort-specific effects we include year-fixed-effects in all our regressions.

We also collected information that proxies for unobservable issuer-specific risk. As is common in the IPO literature, issue size is used to proxy for the level of information available about the issuer. The larger the firm, the more information is available about it; smaller issues are typically offered by startup companies and are seen as particularly risky (Ritter, 1987; Tinic, 1988).

Venture capital affiliation is also correlated with risk. Because venture capital firms are particularly well suited to provide third-party certification, the ability to acquire venture capital can be an indicator of high quality (Chan, 1983; Brav and Gompers, 1997), Venture capital firms depend to some extent on access to the IPO market on favorable terms and on establishing enduring relationships with pension fund managers and other institutional investors. For this reason they

have strong incentives to establish reputations for trustworthiness (Sahlmann, 1990; Megginson and Weiss, 1991; Admati and Pfleiderer, 1994). Barry et al. (1990) document that venture capital firms specialize in portfolio firms to provide intensive monitoring services, taking concentrated equity positions, maintaining investments beyond the IPO, and serving on boards. They, as well as Megginson and Weiss (1991), find that venture capital backing results in significantly lower initial returns. In addition, the presence of a venture capitalist lowers the total costs of going public and helps maximize the net proceeds to the offering firm. Venture capital-backed issuers can also work with better auditors and receive greater attention from institutional investors.

To capture third-party certification we collected data on the pre-IPO ownership percentage of a venture capital firm and include this as a control variable in our regressions.<sup>5</sup> To distinguish third- from first-party certification we also include a dummy variable representing an affiliation between a venture capital firm and one of the (lead) underwriters. Only 26 issuers use underwriters with an affiliation to a venture capital firm or with ownership of pre-IPO equity. These affiliations are found both for universal banks and for specialized banks, but specialized banks are overrepresented in this category. The affiliations could thus be interpreted as a substitute for a lending relationship.

Table 2 provides descriptive statistics for our sample. The table provides means and medians for underpricing, long-term performance, issue size, pre-IPO ownership of a venture capital firm, issuer's pre-IPO revenue, and issuer's pre-IPO total debt. The means and medians are reported separately for universal-bank-underwritten IPOs and IPOs underwritten by specialized investment banks. The third column of the table reports the results of a series of univariate tests for differences in means and medians between the two types of IPOs.

[Table 2 about here]

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<sup>4</sup> Loughran and Ritter (1996) investigate secondary stock prices in the United States and find essentially the same results whether using cumulative abnormal returns or simple buy-and-hold returns.

<sup>5</sup> We include directly held bank equity stakes in this category.

As seen in the table, universal-bank-underwritten IPOs had an average first-day return of 45.5 percent, compared with 25.9 percent for the IPOs underwritten by specialized investment banks. The medians were 15.7 percent and 5.6 percent, respectively. The differences in both means and medians are statistically significant (at the 5 and 10 percent levels, respectively). Long-term performance was virtually the same for both types of IPOs; when excluding the first-day return, the IPOs underwritten by specialized investment banks fare somewhat better, though the differences are not statistically significant. Median issue size is about the same for both types of IPO (€22.3 million and €18.8 million, respectively), though specialized investment banks tend to underwrite the very largest issues, pushing the average issue size for those IPOs to €73.6 million, compared with €39.9 million for the universal-bank-underwritten IPOs (the difference is significant at the 5 percent level).

Venture capital backing is unrelated to underwriter type: average pre-IPO ownership by a venture capital firm is close to 8 percent for both types of IPOs. If universal-bank affiliation and venture backing are alternative forms of certification, then venture-backed issuers should tend to select specialized investment banks. However, these issues are distributed equally between the two underwriter types.

Finally, issuer characteristics like pre-IPO revenue and debt do not differ strongly between bank types. Larger issuers tend to select specialized investment banks, though the differences in average and median issue size are not statistically significant. Highly leveraged firms do tend to choose specialized underwriters; pre-IPO total debt averages €10.6 for universal-bank-underwritten IPOs and €29.9 for IPOs underwritten by specialized investment banks (the difference is significant at the 10 percent level). Median leverage is about the same for the two groups, however.

The table also gives information on issuer industry. Over half the IPOs during this period were in software (including Internet applications and services) and technology. Other important

sectors include financial services, communications, and pharmaceuticals. Eighty-six percent of all IPOs during this period were in these five industries.

## **4. Results**

### *4.1. Underpricing*

Table 3 reports results of two OLS regressions of underpricing on the universal-bank dummy and the control variables described above. The second regression also includes dummy variables for the most commonly represented industries: software and Internet, technology, financial services, communications, and pharmaceuticals. To examine whether banks handpick the issues they underwrite or if issuers self-select to reputable banks, we also include variables representing each bank that underwrote at least ten IPOs as lead underwriter during the 1997–99 period.

The coefficient on the universal-bank dummy is positive and statistically significant in both specifications, indicating that universal-bank underwriting is associated with higher-than-average underpricing, controlling for observable issue- and issuer-specific characteristics. Higher-than-average underpricing is inconsistent with the certification hypothesis: universal banks, as a group, are not selling securities at higher-than-average prices. The finding is also inconsistent with the naive-investor hypothesis, in which banks exploit their informational advantages at the expense of investors. The findings are consistent with the hypothesis that investors impose discounts for possible conflicts of interest: in this case, investors require compensation for the potential hazards associated with universal-bank underwriting.

[Table 3 about here]

The coefficient on venture capital-backing is not statistically significant, which is surprising considering that the previously cited research on venture capital backing in the U.S. finds that

venture capital backing is a sign of a high-quality issue. By contrast, the proxy for risk is consistent with our expectations. Larger issues are associated with lower-than-average underpricing, indicating that investors consider those issues to be safer. Importantly, a relationship between the lead underwriter and a venture capital firm is associated with higher underpricing, consistent with the claim that investors see preexisting relationships—whether due to universal banking or not—as a potential source of conflicts of interest. The initial returns earned for IPOs underwritten by both venture capital affiliates and universal banks could also be interpreted as up-front compensation for these hazards.

These results show that universal-bank-underwritten IPOs are associated with lower average subscription prices, inconsistent with the certification hypothesis. However, some universal banks are larger, older, and more prestigious than others. Universal banks as a group do not appear to certify quality, but some universal banks may do so. To further examine the certification hypothesis we reran the regressions reported in Table 3, this time using dummy variables for individual underwriters instead of a universal-bank dummy. (Because we have 52 underwriters and only 274 observations, we included dummies only for the ten most active underwriters.<sup>6</sup>) Interestingly, the coefficients on two of the underwriter dummies, those for Deutsche Bank and Dresdner Bank, are negative and statistically significant at the 5 percent level, meaning that these two underwriters set above-average subscription prices. None of the coefficients on the other underwriter dummies are statistically significant. Because Deutsche Bank and Dresdner Bank are among the largest (and most reputable) universal banks, this could indicate that issues underwritten by these particular underwriter are perceived to be less risky, on average, than issues underwritten by other universal banks.

This finding is also inconsistent with the claim that universal banks offer discounted securities to reward their own investing clients and asset-management subsidiaries. Of the universal banks in the sample, one would expect the banks with the greatest variety of products, depositors, and mutual fund subsidiaries—banks such as Deutsche Bank and Dresdner Bank—to en-

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<sup>6</sup> We also omitted the industry dummies from this specification.

gage in this practice. The most diversified banks, however, tend to set higher-than-average subscription prices.

If the long-term performance of universal-bank-underwritten securities is normal, then their higher-than-average underpricing may be interpreted as an up-front risk premium that compensates investors for underwriter-specific conflicts of interest. If universal-bank-underwritten securities perform poorly in the long run, however, then this underpricing is better interpreted as up-front compensation for (unobservable) issuer-specific risk. To distinguish between these possibilities we turn next to the long-term performance of universal-bank-underwritten IPOs and IPOs underwritten by specialized investment banks.

#### *4.2. Long-term Performance*

Table 4 reports two pairs of OLS regressions of buy-and-hold returns on the universal-bank dummy and control variables. As described above, we chose two arbitrary end-of-period dates, March 17, 2000 and August 9, 2002. The specifications reported in the first and third columns include the first-day return (i.e., they measure performance as the difference between the price recorded on the respective ending date and the subscription price, all divided by the subscription price). Those reported in the second and fourth columns exclude the first-day return (i.e., they measure performance as the difference between the price recorded on the ending date and the first-day closing price, all divided by the first-day closing price). All four regressions include controls for pre-IPO ownership by a venture capital firm, issue size, a dummy variable for an affiliation between a venture capital firm and a lead underwriter, and industry dummies.

[Table 4 about here]

As Table 4 shows, buy-and-hold returns are not systematically related to bank type or to venture capital affiliation, using either the 2000 or the 2002 ending dates. In the secondary markets, IPOs underwritten by universal banks or by underwriters with a venture capital affiliation cannot be distinguished from IPOs underwritten by specialized, unaffiliated banks. Combined with the results presented in Table 3, this suggests that universal banks and underwriters with venture capital affiliations are systematically discounting IPOs that are otherwise indistinguishable (in the long run) from other IPOs. Investors are concerned about potential conflicts of interest associated with these underwriters and require appropriate compensation for bearing this risk.

Interestingly, while the coefficient on the pre-IPO ownership of a venture capital firm is not statistically significant, the coefficient on the dummy variable representing an affiliation between a venture capital firm and the lead underwriter is negative (and statistically significant in three of the four specifications). While venture backing itself is unrelated to long-term performance, relationships between lead underwriters and venture capital firms are associated with below-average long-term performance, controlling for issue size and industry (and, of course, underwriter type). While universal-bank-underwritten IPOs perform about as well over time as IPOs underwritten by specialized investment banks, IPOs underwritten by firms affiliated with a venture capital firm do not. Moreover, as of March 2000 larger issues were doing worse than smaller issues, while by August 2002 larger issues were doing better than smaller issues. (Inspection of the coefficients on the dummy variables reveals that issuers in software, financial services, and communications were performing extremely poorly by mid 2002.) Of course, the German market as a whole fell dramatically between 2000 and 2002.<sup>7</sup>

In a separate set of regressions (not reported here) with underwriter dummies instead of a dummy for universal-bank underwriting, we again found substantial variation among individual underwriters. The coefficient for Deutsche-Bank-underwritten IPOs is positive and statistically significant, indicating that the negative and statistically significant coefficient on underpricing reflects high quality issues, not an attempt to cross-subsidize or to float low-quality issues at high

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<sup>7</sup> [Explain the different sample sizes in the four columns of Table 4.]

subscription prices. The Dresdner Bank coefficient is also positive but not statistically significant, suggesting that the secondary-market returns of those IPOs are normal. These two large universal banks can underwrite average or superior securities at higher subscription prices. In contrast to the group of universal banks as a whole, these banks appear to select their IPO candidates and to control the potential conflicts of interest associated with their double role as lender and underwriter.

#### *4.3. Choice of Underwriter*

Our results raise a puzzling question: Why do clients of average universal banks accept lower subscription prices? Why would a firm choose a universal bank or a bank with a venture capital affiliation as underwriter, knowing these issues raise less capital than issues underwritten by specialized and unaffiliated underwriters, even for stocks that are otherwise indistinguishable in the secondary markets? More generally, why do banks in Europe and elsewhere seek to integrate commercial and investment banking?

One possible explanation is self-selection: lower-quality issuers tend to select universal banks. Indeed, our underpricing results could be driven not by inherent problems associated with relationship banking, but by unobserved heterogeneity—different types of underwriter systematically underwrite different types of securities. Of course, our underpricing and long-term performance regressions control for observable risks, and the long-term performance results do not indicate that universal banks underwrite low-quality issues. Alternatively, underwriter choice could depend on switching costs and the issuer's desire to protect its private information. Relationship banking offers the client not only one-stop banking and reduced transaction costs but also confidentiality. Srinivasan (2000) shows that switching costs increase a client's propensity to keep an underwriter for repeat issues and as adviser. Banks enticing clients to switch underwriters typically offer free services to compensate for the switching costs incurred by clients that make firm-specific information available to a new bank. For these reasons, firms may choose a

universal bank or venture capital-affiliated bank simply because they have an ongoing relationship with the bank.

To see what leads issuers to choose universal banks as underwriters we estimate a probit model of underwriter type on a set of issuer characteristics including the pre-IPO ownership of a venture capital firm, the issuer's pre-IPO revenue (a proxy for firm size as well as firm age), and the issuer's short- and long-term bank debt.<sup>8</sup> Table 5 reports the results of four specifications of the probit model. The specifications reported in the first and third columns include the four variables described above, with and without industry dummies. The specifications reported in the second and fourth columns add issue size, which is an issuer characteristic to the extent that the issuer decides how much capital to raise before selecting an underwriter.

[Table 5 about here]

As seen in Table 5, issuer characteristics such as size, leverage, and industry are generally poor predictors of underwriter choice. Issue size is negative and statistically significant, suggesting that specialized investment banks are better positioned to underwrite the largest issues. The pre-IPO ownership of a venture capital firm is positive and statistically significant, indicating that venture-backed issuers are more likely to choose a universal bank, controlling for the size of the planned issue and observable issuer characteristics. Surprisingly, the coefficients on the debt variables are not statistically significant. If debt is a good proxy for a preexisting lending relationship with a universal bank, then one might expect highly leveraged firms to choose universal banks as underwriters, preferring to leave money on the table to avoid switching costs. Our findings do not bear out this explanation.

However, the amount of debt may be a poor proxy for preexisting bank relationships, particularly given that we cannot distinguish in our sample between bank debt and commercial paper.

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<sup>8</sup> The information on bank debt and revenue was available only for 106 observations.

An alternative interpretation of Table 5 is that unobservable issuer-specific characteristics, which could include preexisting bank relationships, determine the choice of underwriter. If some issuers have preexisting relationships with particular underwriters, such as a debt relationship with a universal bank, then switching costs might outweigh the cost of leaving money on the table by using the universal bank as underwriter. Unfortunately, because we cannot match debt amounts with particular lenders, and thus cannot identify these relationships, it is difficult to test this interpretation conclusively.

## **5. Conclusion**

This paper investigates the relationship between IPO underpricing, secondary-market IPO returns, and the lead underwriter's bank structure. Universal banks face potential conflicts of interest when they underwrite equities because of their double role as lender and underwriter. The empirical results presented here show that universal banks underwrite stocks that perform normally in the secondary markets, but they set lower-than-average subscription prices. This suggests that investors require compensation for potential conflicts of interest associated with universal banking. We also demonstrate that bank reputation can mitigate these conflicts of interest: the variation in underpricing and secondary-market performance among universal banks indicates self-selection of the better-quality issuers to the most reputable banks. Finally, the paper shows that observable issuer characteristics such as size, leverage, ownership, and industry are generally unrelated to the choice of underwriter, suggesting that other characteristics, such as preexisting bank relationships, are more important.

While the market recognizes that conflicts of interest can arise if commercial banking and investment banking are combined in one institution, our results suggest that investors are aware of these potential problems and require—and receive—an appropriate discount. For this reason, it seems unnecessary to prohibit the combination of commercial banking and investment banking to protect investors. The question of how banking services should be combined is best left to

banks and issuers, who will weigh the benefits associated with combinations against the cost associated with lower capitalization in an IPO.

Further research is needed on the importance of preexisting banking relationships. Duration and relative volumes of loans could be proxies for the quality of information the relationships produce. It would also be interesting to relate this information to a measure of forgone IPO capitalization to infer the relative value of the relationship. Our understanding of such practices could also benefit from more extensive comparisons of investment-banking (and venture capital) relationships with lending relationships. Moreover, the relationships between IPO returns and parent-firm sponsorship, corporate investors, and institutional investors might offer further insight into the role of these corporate monitors and their value as certifiers.

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**Table 1: Sample Banks**

Firms in **bold** are universal banks; firms in *italics* are foreign (non-German) banks.

Lead underwriter	IPOs	Lead underwriter	IPOs
Baader Wertpapierhandelsbank	5	<b>HSBC Trinkhaus Burkhardt</b>	4
<b>Baden Württemberg. Bank</b>	5	<i>ICE</i>	1
<i>BancBostonRobertsonStephens</i>	2	<i>J. Henry Schroder</i>	1
<b>Bank Vontobel</b>	5	<b>JP Morgan</b>	2
<b>Bankgesellschaft Berlin</b>	4	Kling, Jelko, Dr. Dehmel	4
<b>Bay. Hypobank</b>	3	<b>LB Baden Württemberg</b>	2
<b>Bay. Landesbank</b>	3	<i>Lehman Brothers</i>	3
<b>Bay. Vereinsbank</b>	2	<b>M.M. Warburg</b>	5
<b>Bay. Hypo-und Vereinsbank</b>	12	<b>Merck Finck &amp; Co.</b>	1
Berliner Effektenbank	4	<i>Merrill</i>	2
Berliner Freiverkehr	4	<b>Metallbank</b>	5
<b>BHF Bank</b>	10	<i>Morgan Stanley</i>	3
Börsenmakler Schnigge	1	<b>Nord LB</b>	4
<b>Commerzbank</b>	17	<i>Paribas</i>	3
Concord Effekten	7	<i>Raiffeisen Zentralbank Österreich</i>	2
<i>Credit Suisse First Boston</i>	7	<i>Robert Fleming</i>	2
<b>Deutsche Bank</b>	32	<b>Sal. Oppenheim</b>	10
<b>DG Bank</b>	31	<i>Salomon Smith Barney</i>	1
<b>Dresdner Bank</b>	29	<b>Schmidt Bank</b>	1
<i>Fleming</i>	1	<b>SGZ</b>	2
German Brokers	1	<i>Soc. Generale</i>	1
<i>Goldman Sachs</i>	16	<b>Stadtsparkasse Koeln</b>	1
<b>Gontard</b>	7	<b>Trinkhaus Burkhardt</b>	3
<b>Gontard &amp; Metallbank</b>	6	<b>UBS</b>	5
Hanseatisches Wertpapierhandels	2	<b>Vereins- und Westbank</b>	3
<b>Hauck</b>	2	<b>West LB Panmure</b>	19

**Table 2: Descriptive Statistics and Univariate Tests**

Means and medians for 274 German IPOs, 1997-99. *P*-values for difference tests given by *F*-test for means and rank-sum test for medians.

		Universal banks	Specialized investment banks	<i>P</i> -value of difference
Number of IPOs		222	52	
Underpricing (percent)	Mean	45.537	25.905	(0.05)
	Median	15.676	5.586	(0.07)
Long-term performance (including initial return) (percent) (March 2000)	Mean	424.291	430.865	(0.95)
	Median	193.990	193.084	(0.56)
Long-term performance (excluding initial return) (percent) (March 2000)	Mean	306.743	350.569	(0.66)
	Median	97.741	151.773	(0.35)
Issue size (€ millions)	Mean	39.902	73.590	(0.02)
	Median	22.253	18.761	(0.26)
Pre-IPO ownership of a venture-capital firm (percent)	Mean	8.377	7.517	(0.72)
	Median	0.000	0.000	(0.96)
Issuer's pre-IPO revenue (€ millions)	Mean	166.911	191.103	(0.89)
	Median	22.250	27.451	(0.42)
Issuer's pre-IPO total debt (€ millions)	Mean	10.585	29.907	(0.07)
	Median	0.899	0.940	(0.26)
Percent of issuers in				
Software		39.1	25.0	
Technology		21.1	26.9	
Finance		8.1	15.3	
Communications		9.9	7.6	
Pharmaceuticals		8.1	8.1	
Retail trade		2.0	7.0	
Electric equipment		2.4	5.2	
Wholesale trade		1.6	0.0	
Engineering		0.8	7.0	
Miscellaneous manufacturing		1.2	3.4	
All others		5.6	0.0	

**Table 3: Underpricing**

OLS regressions of initial IPO returns on issuer and bank characteristics. Heteroskedasticity-consistent standard errors in parentheses. \*\*\*, \*\* and \* represent statistical significance at the 1, 5, and 10 percent levels, respectively. Year dummies included.

Constant	0.243*** (0.071)	0.187* (0.113)
Dummy for universal-bank affiliation	0.140* (0.078)	0.137* (0.081)
Pre-IPO ownership of venture capital firm	0.316 (0.248)	0.313 (0.240)
Dummy for affiliation between venture capital firm and a lead underwriter	0.498** (0.239)	0.466* (0.276)
Issue size	-0.001*** (0.000)	-0.001*** (0.000)
Software	—	0.124 (0.124)
Technology	—	-0.083 (0.119)
Financial serves	—	0.194 (0.154)
Communications	—	0.253 (0.199)
Pharmaceuticals	—	-0.104 (0.120)
R <sup>2</sup>	0.07	0.09
Number of observations	274	274

**Table 4: Long-Term Performance**

OLS regressions of secondary-market returns on issuer and bank characteristics. Heteroskedasticity-consistent standard errors in parentheses. \*\*\*, \*\* and \* represent statistical significance at the 1, 5, and 10 percent levels, respectively. Year dummies included.

	Ending March 17, 2000		Ending August 9, 2002	
	Including initial return	Excluding initial return	Including initial return	Excluding initial return
Constant	5.137*** (1.073)	6.366*** (1.365)	-0.708*** (0.074)	-0.664*** (0.085)
Dummy for universal-bank affiliation	-0.519 (0.796)	-0.148 (0.957)	0.083 (0.062)	0.102 (0.062)
Pre-IPO ownership of venture capital firm	0.431 (2.278)	1.533 (2.560)	-0.176 (0.106)	-0.153 (0.119)
Dummy for affiliation between venture capital firm and a lead underwriter	-1.819** (0.751)	-2.188** (1.020)	-0.026 (0.072)	-0.023** (0.081)
Issue size	-0.004* (0.002)	-0.005** (0.002)	0.001** (0.000)	0.001*** (0.000)
Software	-0.179 (0.869)	-0.263 (1.090)	-0.227*** (0.068)	-0.269*** (0.083)
Technology	0.217 (1.035)	-0.301 (1.274)	-0.021 (0.095)	-0.018 (0.105)
Financial services	-1.139 (0.880)	-1.035 (1.177)	-0.173** (0.068)	-0.200** (0.072)
Communications	-1.138 (1.101)	-0.838 (1.297)	-0.295*** (0.069)	-0.333*** (0.085)
Pharmaceuticals	3.895 (3.588)	3.327 (3.428)	0.062 (0.128)	0.021 (0.135)
R <sup>2</sup>	0.14	0.14	0.19	0.19
Number of observations	272	272	180	180

**Table 5: Choice of Underwriter**

Probit regression of underwriter choice on issuer characteristics. Dependent variable equals 1 if underwriter is a universal bank and zero otherwise. *P*-values in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1, 5, and 10 percent levels, respectively.

Constant	0.742*** (0.194)	0.992*** (0.232)	0.481 (0.509)	0.794 (0.568)
Pre-IPO ownership of venture-capital firm	4.189** (2.107)	3.648* (2.023)	4.482* (2.304)	4.117* (2.223)
Issuer's pre-IPO revenue	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Issuer's pre-IPO short-term debt	-0.007 (0.006)	-0.009 (0.005)	-0.006 (0.006)	-0.008 (0.007)
Issuer's pre-IPO long-term debt	1.007 (1.164)	0.841 (1.120)	0.586 (0.759)	0.512 (0.748)
Issue size	—	-0.005** (0.002)	—	-0.005* (0.003)
Software	—	—	0.729 (0.591)	0.592 (0.623)
Technology	—	—	-0.070 (0.594)	-0.137 (0.627)
Financial services	—	—	-0.005 (0.775)	0.002 (0.817)
Communications	—	—	-0.480 (0.941)	-0.587 (0.970)
Pharmaceuticals	—	—	0.404 (0.745)	0.141 (0.778)
Log-likelihood	-36.79	-34.40	-34.32	-32.52
Number of observations	106	106	106	106