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Peter G. Klein
University of Missouri

Kathrin Zoeller

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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 270 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.

JEL codes: G32, G34, G21, G24

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Corresponding author: Peter G. Klein, Contracting and Organizations Research Institute, University of Missouri, 135D Mumford Hall, Columbia MO 65211, 573-882-7008, pklein@missouri.edu.

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Universal Banking and Conflicts of Interest: Evidence from German Initial Public Offerings

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, 1994). 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 270 recent German IPOs and relate initial returns (underpricing) and aftermarket 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.

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. Do banks use this information to promote “cherries”—i.e., does universal-bank affiliation certify quality—or do they push “lemons,” trying to transfer their loan risk to uninformed investors? Universal banks could also extend credit at fa-

vorables rates to third-party investors in the understanding they will buy securities in the IPO.¹ 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.² Of course, the market could potentially resolve these conflicts by tying executive compensation to the profit of the bank, imposing internal control mechanisms, relying on third-party monitoring mechanisms, establishing self-regulating institutions, or imposing appropriate discounts on universal-bank-underwritten IPOs. 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).³

Ber, Yafeh, and Yosha's (2001) study of universal banking in the Israeli IPO market finds evidence for certification: issuers whose IPOs were underwritten by their own universal-bank lenders exhibited above average accounting performance following their issues. Gande et al. (1997) find some evidence for certification when they compare debt securities underwritten by Section 20 subsidiaries of U.S. 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. By contrast, Hamao and Hoshi's (2002) study of Japanese corporate bonds finds that investors discount bonds underwritten by bank-owned subsidiaries relative to bonds underwritten by securities firms.

¹ Specialized investment banks are also subject to these temptations. In 2002 U.S. regulators began investigating allegations that Salomon Smith Barney, CFSB, and other investment banks distributed pre-IPO shares of highly desirable issues to corporate executives with the expectations that they would return the favor by steering investment-banking business to the underwriter ("spinning").

² Practitioners often argue that investment bankers underprice IPOs to reduce their exposure to shareholder litigation (Tinic, 1988; Hughes and Thakor, 1992; Drake and Vetsuyens, 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.

³ Chemmanur and Fulghierei (1994a, 1994b) show that investment-bank credibility depends on their equity-marketing history. They also show that commercial banks' desire to acquire and maintain a reputation for reliability provides an incentive to invest heavily in client evaluations.

Empirical studies of U.S. universal banking before the Glass-Steagall Act 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.⁴ 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 obtained 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. Several recent studies (Franzke, 2001; Mayer, 2001; Kraus, 2002; Tykrová, 2003) investigate the relationship between IPO underpricing and venture-capital backing on the German “Neuer Markt,” a segment of the Frankfurt stock exchange reserved for young, growth-oriented firms, primarily in the technology sector.⁵ They find that venture-backed issues are typically more heavily underpriced than non-venture-backed issues. None of these

⁴ Specifically, Kroszner and Rajan (1994) find that universal-bank-underwritten securities were discounted in “information-intensive” cases—i.e., junior securities and securities of younger, smaller, and less well-known firms.

⁵ In September 2002 the German stock exchange announced that the Neuer Markt would be closed by the end of 2003.

German studies focuses on universal banking, however, and they exclude a substantial number of new issues listed on the traditional market.

To see how investors perceive universal-bank underwriting in Germany we study the relationship between underpricing, issue and issuer characteristics, aftermarket performance of the stock, and underwriter type for a broad sample of German IPOs from 1997 to 1999. If investors are naive, we expect universal-bank-underwritten securities to be associated with average underpricing and below-average aftermarket performance, controlling for issue and issuer characteristics. If universal banks underprice to promote their other services, we expect lower-than-average subscription prices (higher-than-average underpricing) and average or better-than-average aftermarket performance. If investors are rational and worried about conflicts of interest, we expect lower-than-average subscription prices (higher-than-average underpricing) and average aftermarket 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 average or superior aftermarket 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, may 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 summarizes the literature on underpricing and universal banking. Section I describes our empirical approach. Section II presents the results, and section III concludes.

I. Data and Methods

To see how universal-bank underwriting affects IPO performance we investigate all 270 IPOs to the German stock market from January 1997 to December 1999. We include IPOs on both the Neuer Markt and the traditional market.⁶ Our analysis relates the initial returns (underpricing) and the aftermarket returns to the type of underwriter and a set of issuer characteristics. 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, is collected from the issuers' prospectuses. Unfortunately, some firms did not report pre-IPO issuer debt, and we generally do not know the identities of the lenders. Thus we do not know if leveraged issuers with universal-bank underwriters have preexisting relationships with their own underwriter, or with another bank. However, this information is also unavailable to investors, who may use total debt as a proxy for a potential conflict of interest between the issuer and the underwriter.

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

⁶ We include only newly public firms in our sample, excluding a handful of existing public companies that made initial listings on the German exchange.

20 percent of the IPOs in our sample as being underwritten by specialized banks.⁷ Table I lists the 52 banks involved with IPOs during our sample period. Several banks underwrote only one IPO; DG Bank, Deutsche Bank, and Dresdner Bank, the most active lead underwriters in the sample, underwrote 30, 29, and 26, respectively.⁸

[Table I 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. As is common in the literature on IPOs we measure aftermarket performance using buy-and-hold returns.⁹ Because our sample covers all of 1999 we focus on 30-month, rather than the more conventional 36-month, returns. We compute both simple buy-and-hold returns (the difference between the price after 30 months of trading and the price at the end of the first trading day, divided by the price at the end of the first trading day) and adjusted abnormal returns using the broad-market DAFOX index developed by Göppl and Schütz (1993). The abnormal return is defined as the natural logarithm of (1 + the buy-and-hold return) minus the natural logarithm of (1 + the percentage change in the DAFOX index during the period in question).¹⁰ To account for time- and cohort-specific effects we include time dummies (quarters or years) in all our regressions.

We also collect 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

⁷ 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.

⁸ 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.

⁹ See, for example, Loughran and Ritter, 1996.

¹⁰ The logarithmic transformation is used because the distribution of returns—with a lower bound of -0.99 and no upper bound—is highly skewed.

issuer (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 collect data on the pre-IPO ownership percentage of a venture capital firm and include this as a control variable in our regressions.¹¹ To distinguish third- from first-party certification we also create a dummy variable representing an affiliation between a venture capital firm and one of the (lead) underwriters. Unlike the situation in the U.S. or U.K., German venture capital is often provided by financial intermediaries (see Kraus, 2001, for details). Twenty-six issuers in our sample 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 II 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

¹¹ We include directly held bank equity stakes in this category.

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 (*t*-tests for means and rank-sum tests for medians).

[Table II about here]

As seen in the table, universal-bank-underwritten IPOs have an average first-day return of 44.3 percent, compared with 26.3 percent for the IPOs underwritten by specialized investment banks. The medians are 13.9 percent and 5.3 percent, respectively. The differences in both means and medians are statistically significantly different from zero. Long-term performance is poor for both types of IPO, with little difference between the two types. The average unadjusted buy-and-hold returns are -53.0 percent for the universal-bank-underwritten IPOs and -61.2 percent for the IPOs underwritten by specialized investment banks, with medians of -78.5 percent and -74.7 percent, respectively. (Neither the differences in means nor the differences in medians are statistically significant.) Median issue size is about the same for both types of IPO (€32.2 million and €26.1 million, respectively), though specialized investment banks tend to underwrite the very largest issues, pushing the average issue size for those IPOs to €116.6 million, compared with €54.1 million for the universal-bank-underwritten IPOs (the difference is significant at the 1 percent level).¹²

Venture capital backing appears 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.

¹² The largest and most important German IPO, that of Deutsche Telekom, took place in 1996, too early to be included in our sample. (Deutsche Telekom made secondary and tertiary offerings in 1999 and 2000, respectively.)

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 €30.9 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. Of the 270 IPOs during this period, 187 (70 percent) were listed on the Neuer Markt. Universal banks tended to focus more heavily on the Neuer Markt than did the specialized investment banks; 72 percent of all universal-bank-underwritten IPOs were listed on the Neuer Markt, while only 57 percent of the IPOs underwritten by specialized investment banks were Neuer Markt listings. 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.

II. Results

A. Underpricing

Table III reports results of two sets of OLS regressions of underpricing on the universal-bank dummy and controls for venture-capital backing, issue size, and Neuer Markt listing.¹³ The second regression in each set also includes industry dummies defined at the 2-digit SIC level. The first set of regressions uses the full sample of IPOs, while the second set uses a restricted sample of 120 IPOs for which we have data on the issuer's pre-IPO debt.¹⁴ For this second set of regressions we also include an interaction term between the universal-bank dummy and the issuer's

¹³ The Neuer Markt dummy is important because a Neuer Markt listing required a six-month lockup period, which the traditional exchanges did not require. We do not include dummy variables for the issue method because all but six of our 270 IPOs were priced by bookbuilding.

¹⁴ In the remaining 150 cases the issuer's pre-IPO debt was not reported on the prospectus.

debt ratio (total debt to revenue, as reported prior to issue). For universal-bank-underwritten IPOs the issuer's pre-IPO debt is a reasonable proxy for the size of the potential conflict of interest between underwriter and investors. For IPOs underwritten by specialized investment banks we have no reason to suspect a relationship between debt and underpricing.¹⁵ All regressions include time-fixed effects.

[Table III about here]

The coefficient on the universal-bank dummy is positive and statistically significant in the first two regressions, 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.

In the third and fourth regression the coefficient on the universal-bank dummy is not significant, but the coefficient on the interaction term between universal-bank underwriting and issuer's pre-IPO total debt is positive and significant. Again, this is consistent with the discount-for-conflicts-of-interest explanation for universal-bank underwriting. Firms that choose a universal bank as underwriter but have little pre-IPO debt are unlikely to have a preexisting relationship with the underwriter, and investors have no reason to be concerned about conflicts of interest in this case. As the issuer's pre-IPO debt increases, however, the discount associated with universal-bank underwriting rises, consistent with the view that investors are wary of preexisting relationships between issuer and underwriter.

¹⁵ As described above, unlike the sample of Israeli IPOs studied by Ber, Yafeh, and Yosha (2001), our sample does not include the lenders' identities, which was generally not reported on the issuer prospectuses.

The coefficient on the dummy variable for venture capital-backing is positive and statistically significant in three of the four regressions, confirming what Franzke (2001), Mayer (2001), and Tykrová (2003) find for Neuer Markt IPOs: venture-backed issues are discounted more heavily than non-venture-backed issues, suggesting that investors do not take venture-capital backing as a signal of quality. 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 (the coefficient on issue size is statistically significant in only one of the four regressions, however).¹⁶ Overall, the results are 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. 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. That paper, along with Schmidt et al. (1988) and Michaely and Shaw (1994), find that issuers with high-reputation underwriters are associated with lower underpricing; Jain and Kini (1999) find that higher investment-banker prestige also increases the firm's survival probability.¹⁷ Underwriter reputation can thus substitute for underpricing as a means of reassuring investors.

¹⁶ Because specialized investment banks tend to underwrite the largest IPOs, the regressions reported in Table 3 could be contaminated by multicollinearity. To check for this we run the regressions again, this time omitting issue size. The results on the other variables are similar to those reported in the table, so multicollinearity does not appear to be a problem.

¹⁷ Krigman, Shaw, and Womack (1999) show, for the U.S., that additional analyst coverage provided by the investment bank, and higher bank reputation, help determine the issuer's choice of underwriter.

To further examine the certification hypothesis we rerun the regressions reported in Table III, this time using dummy variables for individual underwriters instead of a universal-bank dummy. (Because we have 52 underwriters and only 270 observations, we included dummies only for the ten most active underwriters.¹⁸) Interestingly, the coefficients on three of the underwriter dummies, those for Deutsche Bank, Dresdner Bank, and Concord Effekten, are negative and statistically significant, meaning that these particular underwriters set above-average subscription prices. None of the coefficients on the other underwriter dummies are statistically significant. Because these banks, particularly Deutsche Bank and Dresdner Bank, are among the largest (and most reputable) universal banks, this could indicate that issues underwritten by “high-quality” banks are perceived to be less risky, on average, than issues underwritten by other universal banks. In other words, underpricing and reputation may be substitute mechanisms to protect investors from the hazards associated with universal-bank underwriting. This finding also casts doubt on 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 engage in this practice. The most diversified banks, however, tend to set higher-than-average subscription prices.

B. Aftermarket Performance

If the long-term performance of universal-bank-underwritten securities is average, 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.

¹⁸ We also omitted the industry dummies from this specification.

Table IV reports two pairs of OLS regressions of aftermarket buy-and-hold returns on the universal-bank dummy and control variables. The dependent variable in the first two columns is the unadjusted 30-month buy-and-hold return, defined as $\log(1 + [(p_1 - p_0) / p_0])$, where p_0 is the price at the end of the first trading day and p_1 is the price after 30 months. The dependent variable in the third and fourth columns is the unadjusted buy-and-hold return minus the equivalent 30-month return on the DAFOX index. These returns assume that all dividends are reinvested to purchase additional shares. This assumption is innocuous for Neuer Markt firms, most of which paid no dividends. Moreover, because we include a dummy variable for Neuer Markt issues in our regressions, the inclusion of some dividend-paying firms from the traditional exchange should not bias our coefficient estimates. All four regressions include controls for venture capital backing and issue size, and the regressions reported in the second and fourth columns include 2-digit SIC industry dummies.

[Table IV about here]

As Table IV shows, neither the unadjusted buy-and-hold returns nor the DAFOX-adjusted abnormal returns are systematically related to underwriter type. In the secondary markets, IPOs underwritten by universal banks cannot be distinguished from IPOs underwritten by specialized investment banks. Venture-backed issues tend to perform worse than non-venture-backed issues, however. Combined with the results presented in Table III, this suggests that universal banks 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.

In a separate set of regressions (not reported here) with underwriter dummies instead of a dummy for universal-bank underwriting, we again find 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

subscription prices. The Dresdner Bank coefficient is also positive but not statistically significant, suggesting that the aftermarket 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.

C. 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. Saunders and Srinivasan (2001) show 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), the issuer's pre-IPO total debt (relative to revenue), and a dummy for Neuer Markt issues.¹⁹ Table V 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 V about here]

As seen in Table V, issuer characteristics such as venture backing, size, leverage, and industry are generally poor predictors of underwriter choice. The only statistically significant predictors of underwriter type are issue size, which is negative (suggesting that specialized investment banks are better positioned to underwrite the largest issues), and the Neuer Markt dummy, which is positive (suggesting that Neuer Markt issues, which tend to be smaller than issues on the traditional market, are unlikely to choose a specialized investment bank). 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 always distinguish in our sample between bank debt and commercial paper. An alternative interpretation of Table V 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 relation-

¹⁹ As mentioned above, the data on debt were collected from issuer prospectuses. Unfortunately, the information on

ship 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.

III. Conclusion

This paper investigates the relationship between IPO underpricing, aftermarket 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 aftermarket 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.

bank debt and revenue was available only for 114 observations.

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.

References

- Admati, Anat R., and Paul C. Pfleiderer, 1994, Robust financial contracting and the role for venture capitalists, *Journal of Finance* 49, 371–402.
- Ang, James S., and Terry Richardson, 1998, The underwriting experience of commercial bank affiliates prior to the Glass-Steagall Act: a re-examination of evidence for passage of the Act, *Journal of Banking and Finance* 18, 351–395.
- Benston, George J., 1994, Universal banking, *Journal of Economic Perspectives* 8, 121–143.
- Ber, Hedva, Yishay Yafeh, and Oved Yosha, 2001, Conflict of interest in universal banking: bank lending, stock underwriting, and fund management, *Journal of Monetary Economics* 47, 189–218.
- Berger, Allen N., and Gregory F. Udell, 1995, Relationship lending and lines of credit in small business finance, *Journal of Business* 68, 351–381.
- Carter, Richard B., Frederick H. Dark, and Ajai K. Singh, 1998, “Underwriter reputation, initial returns, and the long-run performance of IPO stocks, *Journal of Finance* 53, 285–311.
- Carter, Richard B., and Steven Manaster, 1990, Initial public offerings and underwriter reputation, *Journal of Finance* 45, 1045–1067.
- Chan, Yuk-Shee, 1983, On the positive role of financial intermediation in allocation of venture capital in a market with imperfect information,” *Journal of Finance* 43, 271–281.
- Chemmanur, Thomas J., and Paulo Fulghieri, 1994a, Reputation, renegotiation, and the choice between bank loans and publicly traded debt, *Review of Financial Studies* 7, 475–506.
- Chemmanur, Thomas J., and Paulo Fulghieri, 1994b, Investment bank reputation, information production, and financial intermediation, *Journal of Finance* 49, 57–79.
- Drake, Philip D., and Michael R. Vetsuydens, 1993, IPO underpricing and insurance against legal liability,” *Financial Management* 22, 64–73.
- Francke, Hans-Hermann, and Michael Hudson, 1984. *Banking and Finance in West Germany* (St. Martin’s Press, New York).
- Franzke, Stefanie A, 2001, Underpricing of venture-backed and non venture-backed IPOs: Germany’s Neuer Markt, Center for Financial Studies Working Paper No. 2001/01, Johann Wolfgang Goethe-Universität.
- Gande, Amar, Manju Puri, Anthony Saunders, and Ingo Walter, 1997, Bank underwriting of debt securities: modern evidence, *Review of Financial Studies* 10, 1175–1202.
- Göppel, Hermann, and H. Schütz, 1993, The design and implementation of a German stock price research index (Deutscher Aktien-Forschungsindex DAFOX), in W. Erwin Diewert, Klaus Spremann, and Frank Stehling, eds.: *Mathematical Modelling in Economics: Essays in Honor of Wolfgang Eichhorn* (Springer-Verlag, Berlin).
- Gompers, Paul and Joshua Lerner, 1999, Conflict of interest in the issuance of public securities: evidence from venture capital, *Journal of Law and Economics* 62, 1–28.
- Hamao, Yasushi and Takeo Hoshi, 2002, Bank underwriting of corporate bonds: evidence from japan after the financial reform of 1993, Working paper, Marshall School of Business, University of Southern California.
- Hughes, Patricia J., and Anjan V. Thakor, 1992, Litigation risk, intermediation, and the underpricing of initial public offerings, *Review of Financial Studies* 5, 709–742.

- Jain, Bharat A., and Omesh Kini, 1999, The life cycle of initial public offering firms, *Journal of Business Finance and Accounting* 26, 1281–1307.
- Kraus, Tilo, 2002, “Underpricing of IPOs and the Certification Role of Venture Capitalists: Evidence from Germany’s Neuer Markt,” working paper, University of Munich.
- Krigman, Laurie, Wayne H. Shaw, and Kent L. Womack, 1999, The persistence of IPO mispricing and the predictive power of flipping, *Journal of Finance* 54, 1015–1044.
- Kroszner, Randall S., and Raghuram G. Rajan, 1994, Is the Glass-Stegall Act justified? a study of the U.S. experience with universal banking before 1933.” *American Economic Review* 84, 810–832.
- Kroszner, Randall S., and Raghuram G. Rajan, 1997, Organization structure and credibility: evidence from commercial bank securities activities before the Glass-Steagall Act, *Journal of Monetary Economics* 39, 475–516.
- Loughran, Tim, and Jay R. Ritter, 1996, Long-term market overreaction: the effect of low-priced stocks.” *Journal of Finance* 51, 1959–1970.
- Mayer, M. D., 2001, Venture Capital Backing als Qualitätsindikator beim IPO am Neuen Markt, *Zeitschrift für Betriebswirtschaft*, 71, 1043–1063.
- Megginson, William L., and Kathleen A. Weiss, 1991, Venture capitalist certification in initial public offerings, *Journal of Finance* 46, 897–903.
- Michaely, Roni, and Wayne H. Shaw, 1994, The pricing of initial public offerings: tests of adverse selection and signaling theories, *Review of Financial Studies* 7, 279–319.
- Minsky, Hyman P., 1996, Would Universal Banking Benefit the U.S. Economy?, in Anthony Saunders and Ingo Walter, eds.: *Universal Banking: Financial System Design Reconsidered* (Irwin, Chicago).
- Muscarella, Chris J. and Michael R. Vetsuydens, 1989, The Underpricing of “Second” Initial Public Offerings, *Journal of Financial Research* 12: 183–192.
- Nanda, Vikram, and Youngkeol Yun, 1997, Reputation and financial intermediation: an empirical investigation of the impact of IPO mispricing on underwriter market value, *Journal of Financial Intermediation* 6, 39–63.
- Puri, Manju, 1994, The long-term default performance of bank-underwritten security issues, *Journal of Banking and Finance* 18, 397–418.
- Puri, Manju, 1996, Commercial banks in investment banking: conflict of interest or certification role?, *Journal of Financial Economics* 40, 373–401.
- Ritter, Jay R., 1987, The costs of going public, *Journal of Financial Economics* 19, 187–212.
- Roe, Mark J., 1994. Strong Managers, Weak Owners: The Political Roots of American Corporate Finance (Princeton University Press, Princeton, N.J.).
- Sahlmann, W., 1990, The structure and governance of venture capital organizations, *Journal of Financial Economics* 27, 473–521.
- Schmidt, Reinhard et al., 1988, Underpricing bei deutschen Erstemissionen 1984/85, *Zeitschrift für Betriebswirtschaftslehre* 58, 1193–1203.
- Saunders, Anthony, and Anand Srinivasan, 2001, Investment banking relationships and merger fees, Working paper, Stern School of Business, New York University.
- Tinic, Seha M., 1988, Anatomy of initial public offerings of common stock, *Journal of Finance* 43, 789–822.

Tyková, Tereza, 2003, Is the behavior of German venture capitalists different? Evidence from the Neuer Markt, Center for Financial Studies Working Paper No. 2003/24, Johann Wolfgang Goethe-Universität.

Table I: 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	HSBC Trinkhaus Burkhardt	7
Baden Württembergische Bank	4	<i>ICE</i>	1
<i>BancBoston Robertson Stephens</i>	1	<i>J. Vontobel</i>	2
Bank Vontobel	3	<i>J. Henry Schroder</i>	1
Bankgesellschaft Berlin	1	JP Morgan	1
Bay. Hypobank	3	Kling, Jelko, Dr. Dehmel	3
Bay. Landesbank	3	LB Baden Württemberg	2
Bay. Vereinsbank	2	<i>Lehman Brothers</i>	2
Bay. Hypo-und Vereinsbank	13	M.M. Warburg	3
Berliner Effektenbank	4	Merck Finck & Co.	1
Berliner Freiverkehr	4	<i>Merrill</i>	2
BHF Bank	19	Metallbank	5
Börsenmakler Schnigge	1	<i>Morgan Stanley</i>	3
Commerzbank	15	Nord LB	4
Concord Effekten	7	Paribas	3
Credit Suisse First Boston	7	<i>Raiffeisen Zentralbank Österreich</i>	2
Deutsche Bank	29	<i>Robert Fleming</i>	2
DG Bank	30	Sal. Oppenheim	9
Dresdner Bank	26	<i>Salomon Smith Barney</i>	1
Fleming	1	Schmidt Bank	1
German Brokers	1	SGZ	2
<i>Goldman Sachs</i>	10	<i>Soc. Generale</i>	1
Gontard	4	Stadtsparkasse Koeln	2
Gontard & Metallbank	6	UBS	1
Hanseatisches Wertpapierhandels	2	Vereins- und Westbank	3
Hauck	1	West LB Panmure	15

Table II: Descriptive Statistics

Means and medians for 270 German IPOs, 1997-99. *P*-values for difference tests given by *t*-test for means and rank-sum test for medians. The abnormal return is defined as $\log(1 + [(p_1 - p_0) / p_0])$, where p_0 is the price at the end of the first trading day and p_1 is the price after 30 months, minus the equivalent 30-month return on the DAFOX index. These returns assume all dividends are reinvested.

		Universal banks	Specialized investment banks	<i>P</i> -value of difference
Number of IPOs		221	49	
Underpricing (percent)	Mean	44.343	26.319	(0.08)
	Median	13.921	5.294	(0.08)
Long-term buy-and-hold return (30 months) (percent)	Mean	-53.020	-61.170	(0.45)
	Median	-78.517	-74.651	(0.54)
Abnormal return (30 months)	Mean	-1.729	-1.968	(0.30)
	Median	-1.640	-1.496	(0.56)
Issue size (€ millions)	Mean	54.097	116.611	(0.00)
	Median	32.212	26.137	(0.19)
Pre-IPO ownership of a venture-capital firm (percent)	Mean	8.415	7.743	(0.79)
	Median	0.000	0.000	(0.93)
Issuer's pre-IPO revenue (€ millions)	Mean	167.835	199.716	(0.86)
	Median	22.330	27.451	(0.43)
Issuer's pre-IPO total debt (€ millions)	Mean	10.585	30.884	(0.05)
	Median	0.899	1.354	(0.24)
Percent of IPOs on Neuer Markt		72.0	57.1	
Percent of issuers in				
Software		38.9	22.4	
Technology		21.3	28.6	
Finance		8.1	16.3	
Communications		10.0	8.2	
Pharmaceuticals		8.1	2.0	
Retail trade		2.7	6.1	
Electric equipment		1.8	6.1	
Wholesale trade		1.8	0.0	
Engineering		0.9	6.1	
Miscellaneous manufacturing		4.5	2.0	
All others		1.8	2.0	

Table III: Underpricing

OLS regressions of initial IPO returns on underwriter and issuer characteristics. The first two regressions use the full sample of 270 IPOs; the third and fourth regressions use a restricted sample of 120 IPOs for which we have data on the issuer's pre-IPO total debt. Heteroskedasticity-consistent standard errors in parentheses. ***, ** and * represent statistical significance at the 1, 5, and 10 percent levels, respectively. Year dummies included.

	Full sample		Restricted sample	
Constant	0.201*	0.418*	0.482***	0.284
	(0.103)	(0.223)	(0.175)	(0.199)
Dummy for universal-bank underwriter	0.167**	0.221**	-0.024	-0.041
	(0.083)	(0.099)	(0.150)	(0.150)
Universal-bank underwriter * total debt	—	—	0.022**	0.019*
			(0.009)	(0.010)
Dummy for venture-capital backing	0.228***	0.247***	0.189*	0.162
	(0.083)	(0.085)	(0.112)	(0.127)
Issue size	-0.030*	-0.021	-0.033	-0.015
	(0.016)	(0.021)	(0.020)	(0.018)
Neuer Markt dummy	-0.079	-0.082	-0.254*	-0.206
	(0.089)	(0.094)	(0.140)	(0.129)
Industry dummies	no	yes	no	yes
R^2	0.07	0.15	0.11	0.28
Number of observations	270	270	120	120

Table IV: Long-Term Performance

OLS regressions of aftermarket returns on issuer and bank characteristics. The dependent variable in the first two columns is the unadjusted 30-month buy-and-hold return, defined as $\log(1 + [(p_1 - p_0) / p_0])$, where p_0 is the price at the end of the first trading day and p_1 is the price after 30 months. The dependent variable in the third and fourth columns is the unadjusted buy-and-hold return minus the equivalent 30-month return on the DAFOX index. These returns assume all dividends are reinvested. Heteroskedasticity-consistent standard errors in parentheses. ***, ** and * represent statistical significance at the 1, 5, and 10 percent levels, respectively. Dummies included for each quarter.

	Buy-and-hold return		Abnormal return	
Constant	-2.332*** (0.370)	-3.418*** (0.539)	-2.362*** (0.368)	-3.433*** (0.543)
Dummy for universal-bank underwriter	0.221 (0.247)	0.242 (0.254)	0.231 (0.247)	0.252 (0.253)
Dummy for venture-capital backing	-0.494*** (0.185)	-0.525*** (0.174)	-0.496*** (0.184)	-0.529*** (0.173)
Issue size	0.143*** (0.052)	0.093 (0.056)	0.144*** (0.053)	0.094 (0.058)
Neuer Markt dummy	0.138 (0.185)	0.230 (0.179)	0.142 (0.185)	0.238 (0.179)
Industry dummies	no	yes	no	yes
R^2	0.23	0.40	0.16	0.35
Number of observations	261	261	261	261

Table V: Choice of Underwriter

Probit regressions 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. Year dummies included.

	—1.449 (0.229)	0.827*** (0.234)	0.409 (0.666)	0.596 (0.684)
Dummy for venture-capital backing	0.172 (0.291)	—0.033 (0.307)	0.269 (0.330)	0.090 (0.342)
Issuer's pre-IPO revenue	0.002 (0.012)	0.009 (0.012)	0.012 (0.016)	0.015 (0.017)
Issuer's pre-IPO total debt	0.059 (0.102)	—0.047 (0.095)	0.113 (0.156)	0.122 (0.184)
Issue size	—	—0.003** (0.002)	—	—0.002 (0.001)
Neuer Markt dummy	0.650** (0.287)	0.602** (0.299)	0.910*** (0.328)	0.860** (0.339)
Industry dummies	no	no	yes	yes
Log-likelihood	—52.22	—47.55	—42.86	—40.28
Pseudo R^2	0.06	0.15	0.21	0.26
Number of observations	120	120	114	114