

## Banking Relationships and Access to Equity Capital Markets: Evidence from Japan's Main Bank System

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Abstract

We study the role of banking relationships in IPO underwriting. Among other issues, we consider whether banking relationships lead to increased access to public equity markets, especially for smaller, lesser-known firms. When a firm in Japan goes public, it can engage an investment bank that is related through a common main bank, or can select an alternative investment bank. The main bank relationship can be an efficient way for the investment bank to acquire information generated by the main bank, but may give rise to conflicts of interest. We use data from two different investment banking regimes in Japan (a hybrid auction-method regime and a book-building regime) and find that main bank relationships give small issuers increased access to equity capital markets, but that issuers of large IPOs switch to non-related investment banks that are capable of managing large offerings. While we find evidence that investment banks seek to exploit bargaining power with related issuers, we also find that issuers respond to expected high issue cost by switching to non-related investment banks. The net result is that total issue costs through related and non-related investment banks are similar. With respect to aftermarket performance and use of offer proceeds, we find no evidence of conflict of interest or self-dealing for either the main bank or the investment bank.

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## **Abstract**

We study the role of banking relationships in IPO underwriting. Among other issues, we consider whether banking relationships lead to increased access to public equity markets, especially for smaller, lesser-known firms. When a firm in Japan goes public, it can engage an investment bank that is related through a common main bank, or can select an alternative investment bank. The main bank relationship can be an efficient way for the investment bank to acquire information generated by the main bank, but may give rise to conflicts of interest. We use data from two different investment banking regimes in Japan (a hybrid auction-method regime and a book-building regime) and find that main bank relationships give small issuers increased access to equity capital markets, but that issuers of large IPOs switch to non-related investment banks that are capable of managing large offerings. While we find evidence that investment banks seek to exploit bargaining power with related issuers, we also find that issuers respond to expected high issue cost by switching to non-related investment banks. The net result is that total issue costs through related and non-related investment banks are similar. With respect to aftermarket performance and use of offer proceeds, we find no evidence of conflict of interest or self-dealing for either the main bank or the investment bank.

**Key Words:** Main Bank, Banking Relationships, Capital Market Access, IPOs, Underwriting, Japanese Economy

**JEL codes:** G21, G24, L22, L51

## **Banking Relationships and Access to Equity Capital Markets: Evidence from Japan's Main Bank System**

### **I. Introduction**

Policy makers in many countries have grappled with whether integration of commercial banking and investment banking services is likely to benefit or harm corporate clients and their investors. If commercial banks are integrated into investment banking, the banks might engage in “self-dealing” by underwriting public offerings of credit clients to effect wealth transfers from the clients and/or investors to themselves. Further, integrated banks may gain bargaining power over their credit clients who seek investment banking services. On the other hand, the commercial bank’s experience with its clients could reduce information costs, resulting in greater access to public capital markets for their clients.

In the US, early controversy concerning participation of commercial banks in corporate securities underwriting resulted in the Glass-Steagall Act (The Banking Act of 1933). The Act, which prohibited combining investment and commercial banking functions, was enacted in the context of allegations of conflicts of interest and abuse by commercial banks that were integrated into investment banking. Sixty-six years later, Congress reversed this policy and repealed the Act’s restrictions on affiliations between securities firms and commercial banks. The reversal signaled that US policy makers had accepted the view that potential benefits of improved access outweigh potential conflicts of interest when banks provide both lending and underwriting services.<sup>1</sup> One argument in favor of repeal was that integration could increase public capital market access for small, young, and/or relatively unknown firms.

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<sup>1</sup> The Gramm-Leach-Bliley Act (The Financial Services Modernization Act of 1999) repeals provisions contained in Sections 20 and 32 of the Glass-Steagall Act.

Extant empirical literature on banking relationships and integration of commercial and investment banking functions generally does not support the conflict of interest hypothesis.<sup>2</sup> However, the studies focus on debt and preferred equity or seasoned equity underwriting. A stronger test of the conflict of interest hypothesis would examine, as we do, those securities issues for which informational asymmetries are likely to be material, such as initial public offerings (IPOs). Furthermore, there is little modern evidence on how relationships between commercial and investment banks may facilitate capital market access.

Investment banks can be related to commercial banks in various ways, ranging from complete integration (at one extreme) to overlapping ownership and management, as in Japan, where, banks are related through *keiretzu* structures. In this paper we examine the role of banking relationships in Japan's IPO underwriting market. In Japan, the *keiretzu* structure allows main banks to hold equity interests in their commercial banking clients, including investment banks. Issuing firms can choose whether to engage an investment bank that is related to it by virtue of sharing the same main bank. The study contributes to the literature in two ways. First, we examine the pricing and performance of information-intensive securities and do so in a period of extreme financial system stress for Japan (1995-1999). Both information asymmetry and financial system stress increase incentives for bankers to behave opportunistically. Thus, we “stack the deck” in favor of finding evidence of conflicts, thereby addressing a gap in empirical research. The time period of the study has the additional advantage of spanning two different underwriting regimes—a hybrid auction regime (variants of which are in use in several countries) and a book-building regime (similar to the US method).<sup>3</sup> This feature allows us to contrast the importance of main bank relationships across

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<sup>2</sup> We review the literature below in Section II.

<sup>3</sup> See Sherman (2002) for documentation on IPO methods used internationally.

two very different underwriting processes. Second, we examine issuing firms' choices to engage related investment banks to underwrite IPOs. We look at a spectrum of IPO underwriting outcomes to evaluate whether banking relationships lead to conflicts of interest. We examine the impact of relationships on total costs (including fees and underpricing), issuing firm access to public equity markets, aftermarket performance of issues, and use of issue proceeds.

The conflict of interest hypothesis is that when an issuer is related to an investment bank, the investment bank may seek to deceive investors into overvaluing the issue and/or may cause the firms to issue for the benefit of the investment bank or commercial bank. The conflicts of interest can be manifested in several ways.<sup>4</sup> First, by misleading investors about the value of an issue, a related underwriter can attempt to effect a wealth transfer from IPO investors to the issuer and/or the commercial bank. Second, if the commercial bank's lending activities give the related investment bank bargaining power, the investment bank can attempt to exploit its information advantage by charging higher fees or underpricing the issue more than would be possible in a market where no underwriter has an information advantage. In this case, the wealth transfer is from the issuer to the underwriter and IPO investors (underpricing may indirectly benefit the underwriter).<sup>5</sup> Third, the value of the issuer could be reduced by inappropriately using issue proceeds to pay off a risky outstanding loan to the commercial bank, thereby harming existing investors.

Alternatively, when an issuer is related to an investment bank through a common commercial bank, the relationship may lower the costs of obtaining information or improve

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<sup>4</sup> For discussion of the types of conflicts of interest that may arise in this setting, see Benston (1990)

<sup>5</sup> Total issue cost includes underpricing, which benefits investors directly. However, underwriters may expect to be compensated in indirect ways for allocating underpriced shares to favored investors. See Loughran and Ritter (2003) who discuss allocations of "hot" IPOs to the personal brokerage accounts of issuing firm executives.

information quality. The information hypothesis suggests that relationships between commercial banks and investment banks benefit issuers and increase access to capital markets.

To test these alternative hypotheses, we use Japanese data and assume that issuing firms seek to minimize total issue cost by their selection of the investment bank. Correspondingly, by examining aftermarket performance, we test whether investment banks' due diligence and pre-marketing activities lead investors to make unbiased assessments of issuers' aftermarket values.

Our findings demonstrate that small firms that undertake small IPOs tend to engage their related investment banks. While the evidence indicates that related investment banks try to underprice more, issuing firms are able to respond by selecting non-related investment banks. The result is that issue costs are no higher for issuers who elect to use a related investment bank. We find no significant evidence that issuers or capital market investors in Japan are harmed by relationships between main banks and investment banks, and instead find that banking relationships increase capital market access for small firms making small issues.

## **II. Banking Relationships and Credit Markets**

The effects of banking relationships on access to capital and on borrowing cost have been subject to extensive theoretical and empirical study. One stream of literature concerns the effects of commercial bank relationships on access to credit. A second stream concerns the conflicts of interest that arise when commercial banks integrate into investment banking. A third concerns how organizational choices can mitigate investor concerns with conflicts.

## **A. Banking Relationships and Access to Credit**

Stiglitz and Weiss (1981) observe that market frictions related to information asymmetry can impede the flow of capital to investments. Leland and Pyle (1977), Campbell and Kracaw (1980), Diamond (1984, 1991), and Fama (1985) all suggest that firms with close ties to financial institutions should have access to lower cost funds.

Consistent with these theoretical studies, Petersen and Rajan (1994) hypothesize that institutional creditors can partially overcome market frictions by producing information about firms and using the information in their credit decisions. They find that close ties with creditors have a small effect on the cost of credit, but that availability of credit financing is greater for firms with ties to creditors. Hoshi, Kashyap, and Scharfstein (1991) study credit relationships in Japan and find that firms with close ties to commercial banks are less likely to be liquidity constrained.<sup>6</sup>

There are several reasons for expecting that banking relationships may facilitate access to capital markets. Recognizing that banks that are related to issuers have an information advantage, James (1984) provides evidence of a certification role of commercial banks and James and Weir (1990) demonstrate that the existence of a commercial bank lending relationship results in less IPO underpricing. Diamond (1984) observes that, in conjunction with providing credit, commercial banks also perform a monitoring function and that the full cost of bank credit must compensate the lender for monitoring costs.

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<sup>6</sup> Berger and Udell (1995) study commercial bank relationships and their importance to small firms. They find that such relationships are a likely mechanism for solving asymmetric information problems and that they provide valuable information about firm quality. For a survey of the literature on relationship banking, see Boot (1999).

## **B. Commercial Bank Integration into Investment Banking**

Rajan (1992) models the borrower's choice between informed bank debt and arms-length public debt as an aspect of the firm's effort to offset the benefits of the related lender's ongoing monitoring against the lender's bargaining power. If commercial bank relationships yield information advantages, then integration of commercial banking and investment banking in a single institution may enhance a lender's bargaining power. In addition, a lender that is integrated into investment banking is faced with a conflict of interest, in that the proceeds of capital market financing may be used to extinguish bank debt.

Puri (1999), in a model that is focused on public credit markets, compares the certification capabilities of commercial banks that are integrated into investment banking to the certification capabilities of independent investment banks. She concludes that commercial banks are able to certify higher values than are investment banks, based on access to information derived through pre-existing lending relationships. She also concludes that a commercial bank's ability to certify is reduced when issue proceeds are used to extinguish debt that is owed to the bank and that equity ownership in the issuer also reduces ability to certify.

Several empirical studies have tested the conflict of interest hypothesis by examining the US experience in the pre-Glass-Steagall era, when commercial banks legally could make loans to firms and also underwrite their securities. The hypothesis suggests that default rates would be higher for commercial-bank-underwritten debt than for investment-bank-underwritten debt. Ang and Richardson (1994), Kroszner and Rajan (1994) and Puri (1994) examine the *ex post* default performance of debt securities underwritten by commercial banks and by investment banks and Puri (1996) examines the pricing of the debt issues, arguing that



looking only at *ex post* performance is incomplete because pricing should reflect expected default rates. The studies find that issues underwritten by commercial banks have lower default rates. Using data from 1927-1929, Puri (1996) compares the pricing of debt and preferred stock underwritten by commercial banks with the pricing of similar securities underwritten by investment banks. Consistent with Puri (1999), she finds that commercial banks are able to certify higher values, particularly for securities where information costs are high. Her evidence indicates that commercial banks may generate an information advantage that benefits issuers through higher net proceeds.

### **C. Choice of Organizational Structure**

Given the tension between information cost savings and conflict of interest, the structure of banking organizations can be expected to reflect efforts to realize information cost savings while mitigating conflicts. Kroszner and Rajan (1997) use pre-Glass-Steagall data to study how the degree of integration affects issue quality and pricing. They conclude that market pressures induced commercial banks to address conflicts of interest by choosing levels of integration into investment banking (separately incorporated bank affiliates versus integrated investment banking departments).

Several studies examine US experience in the years since deregulation.<sup>7</sup> While data are limited, the studies indicate that commercial banks seeking to integrate underwriting activities have responded to concerns about conflict of interest through their choices of organizational form. Using reasoning similar to Kroszner and Rajan, Narayanan, Rangan and Rangan (2001) argue that commercial banks can use underwriting syndicates to militate against opportunism. They find that syndicate arrangements are rewarded with better prices

for seasoned equity issues compared to prices obtained when such issues are underwritten by a commercial bank that has a lending relationship with the issuer.<sup>8</sup> Chaplinsky and Erwin (2001) study structural change in US equity underwriting since deregulation. They find that commercial banks have made inroads into investment banking, but mainly through acquisition of independent investment banks. The aggregate market share of merged firms declines significantly following merger and the decline is more pronounced for IPOs than seasoned offerings. This finding challenges the importance of information economies that may arise from lending relationships, and suggests that client firms are concerned about potential conflicts when integrated banks underwrite issues.

Overall, the evidence from previous research suggests that elimination of regulatory constraints on integration of lending and underwriting is not harmful to investors or issuers. However, success at integration depends on how the organizational structure addresses potential conflicts of interest, and at the same time, realizes the informational economies from the lending function.

### **III. Investment Banking Institutions in Japan**

During the period of our study, commercial banks in Japan were prohibited from direct involvement in investment banking.<sup>9</sup> However, unlike in the US, commercial banks, investment banks, and other firms could be involved in long-term main-bank-centered relationships.

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<sup>7</sup> Beginning in 1989, the Federal Reserve selectively allowed banks to underwrite debt and equity securities using an exemption found in section 20 of Glass-Steagall Act. Deregulation culminated in the 1999 Gramm-Leach-Bliley, *supra*, note 1.

<sup>8</sup> Also see Gande et al. (1997), who examine debt issues by commercial banks that set up Section 20 subsidiaries subject to “firewalls” that limit information and financial linkages between them and their respective parent holding companies. They find that, with these protections in place, in-house underwriting does not lead to greater conflicts.

<sup>9</sup> Although commercial banks could own equity in investment banks, Section 65 of Japan’s Securities and Exchange Law (1948) prohibited mergers of commercial banks and securities firms.

## A. Japan's Main Bank System

The post-war Japanese financial system was bank-dominated because of a combination of strong government favoritism of bank financing and tight regulation of securities markets. Hoshi and Kashyap (2001) note that within the banking system, firms developed a particularly tight relationship with a specific bank, often identified as a “main bank” relationship. In a comprehensive study, Aoki and Patrick (1994) describe the main-bank system as an “informal set of regular practices, institutional arrangement, and behavior that constitute a system of corporate finance and governance...” (p. xxxi). They state, “The main bank not only provides loans, it holds equity, and, in the eyes of the capital market participants and regulators, is expected to monitor the firm and intervene when things go wrong. (p. 2). Hoshi and Kashyap note that, by definition, a main bank has “close ties to its customers through lending, shareholding and (often) board representation and other personnel placement.”(p. 190).

Some recent literature challenges the economic significance of these *keiretsu* relationships.<sup>10</sup> The evidence from these studies suggests that the costs of the *keiretsu* system, and the attendant main bank relationships, are growing while the benefits are declining. Further, this literature suggests that the weakening of *keiretsu* ties has been more pronounced during the last decade, as financial deregulation in the 1990s has taken hold and capital markets have deepened. Therefore, our analysis also is an implicit test of whether these informal networks continue to be economically significant.

The late 1990s was a period of turmoil for Japan's financial system. The system's solvency was jeopardized by a common practice of banks over-extending credit to existing

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<sup>10</sup> See Miwa and Ramseyer (2002) and Okamura (2000).

clients and making new loans to problem customers to disguise and postpone defaults.<sup>11</sup> During this period, Japan was aggressively restructuring, deregulating, and opening its financial system and markets through a series of changes, culminating in the later part of the 1990s in what has been referred to as the Big Bang.<sup>12</sup>

## **B. Regulation of Public Offerings in Japan**

During the 1995 to 1999 period, two different regulatory regimes governed the initial public offering process. From 1995 through late 1997, IPO issuers were required to use a hybrid auction method. Since late 1997 issuers have been permitted to select either the auction method or a book-building method similar to the US method. Since shortly after its introduction, all issuers in Japan have selected book building. Additionally, the equity capital market over the period was tumultuous. Coinciding with the auction portion of our sample period, the equity market in Japan declined steadily. Between January 1995 and the end of September 1997, the JASDAQ Index lost 45 percent of its value. During the book-building portion of our sample period, the JASDAQ index appreciated by 139 percent. Hence, for both reasons, the environments for security offerings were very different between the two regimes.

Previous research by Kutsuna and Smith (2003) documents significant differences in the outcomes of the IPO process under these two regimes. In particular, they find that, compared to book building, the underwriter's role in the auction regime is more limited, and that smaller and riskier firms were more likely to go public in the book-building regime.

***The Auction Regime:*** Under the hybrid auction procedure, in place in Japan from 1989 until late 1997, the issuer designated a portion of the issue (usually 50 percent) to be offered

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<sup>11</sup> See Brewer, et al. (2003) examine the failures of three Japanese banks during this period and the accompanying stock market reactions.

via a discriminatory auction. Prior to the auction, the firm's underwriter issued a preliminary prospectus that specified a minimum bid, based on a mandated formula. Regulations precluded insider participation in the auction and limited the maximum number of shares any single participant could bid to acquire. After the auction was complete, the underwriter would conduct a formal firm-commitment offering of remaining shares, where the issue price was determined based on demand information obtained from the auction.

The underwriter's role in the auction method IPO was limited. The underwriter used the formula to set the minimum bid price, conducted the auction, set the public offer price based on the auction results, and conducts the firm-commitment offering. In addition, the underwriter conducted due diligence on the issuer and prepared the preliminary and final prospectuses used in the offering and effectively guaranteed the firm commitment offer price to the issuer. During the auction regime, underwriter fees were fixed by informal agreement at artificially low levels, averaging 3.4 percent of gross proceeds.

***The Book-building Regime:*** The book-building method, introduced in Japan in late 1997, is modeled after the US system. Under this system, underwriters and issuers use road shows and other pre-marketing methods to assess indications of interest, and determine offer price. There is no requirement that the offer price be linked by formula to values of comparable firms and there is no limit on the number of shares that any one investor can purchase. The underwriter can allocate shares of over-subscribed offerings to preferred customers, as in the US. Under the book-building method, as in the US, the underwriter establishes a filing range that appears in the preliminary prospectus. The filing range is set

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<sup>12</sup> Restrictions that separate commercial and investment banking were not lifted until October 1999. Hoshi and Kashyap (2001) note, at p. 291, that restrictions that separate banking, securities business, and insurance were completely lifted by April 2001.

based on the underwriter's due diligence and examination of market valuations of other issues.

The two underwriting approaches encompass very different roles for underwriters. In the auction regime, the underwriter's role is more passive, and issue pricing is determined mainly by the results of the auction. In the book-building regime, the underwriter establishes the filing range based on its due diligence and valuation efforts, and pre-sells the issue. Thus, we expect that main bank relationships may be less important for improving capital market access in the auction regime. Our evidence is consistent with this expectation.

#### **IV. Data**

Our data include all JASDAQ IPOs over the period 1995 through 1999, 484 total IPOs, including 321 from the auction regime and 163 from the book-building regime. While a few companies in Japan go public on the Tokyo Stock Exchange, the overwhelming majority of IPOs in Japan occur on JASDAQ.

##### **A. Issue Characteristics**

Table 1 provides descriptive statistics for IPOs during both regimes. The many significant differences between the regimes suggest that we examine the effects of main bank relationships separately for the two regimes. Panel (a) shows characteristics of the issuing firms. Consistent with the above discussion, firms going public during the auction regime are older than firms going public during book building. Market capitalization, which we use as a measure of firm size, shows that average size in book building is larger but median size is lower. While the difference in means is not statistically significant, the book-building regime includes a more varied and skewed distribution of issue sizes. The relative proportions of firms in commercial, manufacturing, service, and other industries are similar over the two

periods. The money center variable measures the number of IPOs completed in a firm's prefecture during the sample period, and is used as an indicator of the firm's proximity to a major money center. Access to leading commercial banks and investment banks may depend on the issuer's location. Tokyo prefecture, for example, had the highest level of IPO activity, with 241 IPOs (49.8 percent of the sample). Next were Aichi with 33, Osaka with 30, and Kanagawa with 29. Five of Japan's 47 prefectures had no IPOs during the period, 14 had only one IPO.

Panel (b) shows information on market-wide value changes or "run-up" in the JASDAQ Index in the 20-day interval and 40-day interval before the IPO. Market-wide value change before the IPO are expected to affect realized total issue cost, as offer terms do not fully adjust to market-wide changes. Significant differences in market-wide value changes between the regimes are apparent in the averages. The table also shows market-adjusted one-month and 12-month mean and median returns following the IPO, but the differences in aftermarket performance between regimes are not statistically significant.

Offer characteristics displayed in panel (c) indicate that average issue size is similar in both regimes. However, issue size is more variable in the book-building regime and the distribution is more highly skewed. Average total issue cost is significantly higher during the book-building regime. Issue cost is measured as underwriting fee plus underpricing per share, divided by first aftermarket price. In part, the difference between regimes is attributable to the difference in market run-up that is documented in panel (b). This is because pricing of issues reflects information available 20 to 40 days prior to issue; hence, the greater the run-up the greater the underpricing will be.

Panel (c) also contains information on use of proceeds. Use-of-proceeds percentages are based on primary shares. On average, 40 percent of IPO shares in the auction regime, and 39 percent in the book-building regime, were secondary sales. As shown, there are differences between regimes in the reported uses of primary-share proceeds. Most notably, during the book-building regime, use of proceeds to repay debt is lower and issuing firms report a higher percentage of proceeds not identified with any specific purpose. Conceivably, it is more important for a prospectus to specify proceed uses when shares are sold via auction, as the underwriter's role in auction IPOs is more limited.

Finally, panel (d) contains information on main bank relationships and underwriter market share. The variable, "Related I-Bank" indicates whether the underwriter and the issuing firm are related through the same main bank. Consistent with the view that *keiretsu* relationships are weakening, the percent of issues that involve related investment banks is low during both regimes. In contrast, the percent of IPO issuers using major underwriters is high in both regimes. The suggestion is that issuers face tradeoffs between the potential benefits of main bank relationships and the potential benefits of using a major underwriter to conduct the IPO.

## **B. Main Bank Relationships**

In Table 2, we identify the investment banks that underwrote IPOs during the study period and their affiliated main banks. For issuers, we rely on Research Group for Disclosure identification of main banks, which is based on information from the issuer's prospectus. Main bank affiliations of investment banks are determined on the basis of the commercial



bank's holding of equity in the investment bank as of March 1999.<sup>13</sup> Equity holdings are reported by Toyo Keizai Databank on Kigyo Keiretsu (2000).

Figures in Table 2 for "I-Bank Market Share" are the percentages of IPOs, during each regime, that were underwritten by the specified investment bank. For example, Nomura is the largest underwriter, and underwrote approximately 33 percent of the IPOs over the sample period. Similarly, figures for "Main Bank Market Share" are the percentages of issuers that are affiliated with a specified main bank. To illustrate, Sakura is the main bank of 8.1 percent of the sample firms during the auction regime. Figures in the "Related Bank Market Share" column are the percentages of IPOs where the issuer and the underwriter have the same main bank. The column shows, for example, that during the auction regime, for 2.5 percent of all issues, Nomura underwrote the issue of firms that had Sakura their main bank.

The bottom row of the table shows the percentages of IPOs for which the issuer's commercial bank is small. As shown, during the auction regime, 35.5 percent of issuers had main banks that were not main banks of any underwriter. These small commercial banks tend to be located in prefectures with low IPO activity, and while these banks may own some equity in investment banks, they are not main banks of any investment bank.

Table 2 shows a clear demarcation between the few investment banks with high IPO market shares and the larger number with low shares. In subsequent analysis, we classify investment banks with market shares above 10 percent during a regime as major underwriters. Nomura, Daiwa, and Nikko are classified as majors in both regimes. Yamaichi, which was a major during the auction regime, failed around the time of the change to book building. For

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<sup>13</sup> Because of the bankruptcy of investment bank, Yamaichi, in late 1997, we use equity holdings as of March 1995 to identify Yamaichi's main bank for those IPOs underwritten prior to bankruptcy. Also, due to the merger of Nikko Securities and Solomon in 1998, we use equity holdings as of March 1998 to identify the main bank for

major underwriters, the percentages of issues where the issuer and the investment bank are related generally are somewhat higher than what would be expected by chance assignment of issuers to investment banks based on investment bank market shares. Most small investment banks have lower than expected percentages of related issues. A few, Kankaku in particular, have higher levels of related IPOs than would be expected by chance. Overall, the evidence in Table 2 suggests that issuers sometimes migrate to large investment banks and other times remain with their related investment bank.

An issuer's relationship with an investment bank is determined, in part, by the issuer's locality. In the Tokyo prefecture, for example, 42.7 percent of issuers were affiliated with major underwriters. In contrast, only 15.2 percent of issuers in other prefectures were affiliated with major underwriters. In areas other than Japan's main money center, issuers are more likely to have small main banks that are affiliated with smaller investment banks, or to have commercial banks that do not have a main bank relationship with any investment bank. We classify IPOs as conducted by a "non-related" investment bank unless the issuer has a direct relationship to the investment bank through a common main bank.<sup>14</sup>

### **III. Empirical Results**

#### **A. Bivariate Statistics and Tests of Conflict of Interest and Capital Market Access**

Table 3 shows characteristics of IPOs using related and non-related investment banks, and Table 4 shows characteristics of IPOs using major and non-major investment banks. We use these bivariate comparisons to test for conflicts of interest and to examine the impact of

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all Nikko-backed IPOs prior to that date and use holdings as of March 1999 for IPO observations dated from April 1998 to the end of the sample period.

<sup>14</sup> Small commercial banks may have correspondent relationships with money-center banks and issuers may use those relationships to increase access to a major investment bank. In our sample, investment banks that are related to a *correspondent* of the issuer's main bank underwrote 12 IPOs that we classify as non-related. We replicated the empirical analysis presented below, reclassifying these observations as related. Results are similar to those reported.

banking relationships on capital market access. Because the regimes generally cannot be pooled, we test the auction and book-building regimes separately. The tables also report significant tests on the combined data from both regimes.

***Use of Related and Non-related Investment Banks:*** As reported in Table 3, in both regimes, IPOs of firms related to investment banks have lower mean total issue cost and lower underpricing. However, these issues also have more negative JASDAQ performance over the 40 days before the IPO. Thus, in part, differences in issue cost are attributable to differences in market-wide performance before the IPO.

The difference in market run-up for IPOs using related versus non-related investment bank does not preclude the possibility that the observed cost differences result partly from using a related investment bank. The joint probability that, by chance, market run-ups of IPOs with related investment banks would be significantly lower at the observed levels in both regimes is less than one percent. However, we can find no obvious explanation for the difference. For example, in neither regime is there a secular timing difference between related and non-related IPOs that might produce a spurious result associated with the drift of the market. Conceivably, related investment banks are more willing to underwrite IPOs following declining or non-rising markets. Also, issues involving non-related investment banks may more likely be cancelled in the face of market declines. We tested for this indirectly, by comparing the percent of IPOs with zero or negative run-ups over the 40 days before the offering. Consistent with this possibility, the percentages of IPOs with non-positive run-ups were significantly higher for non-related investment banks in both regimes. Alternatively, investment banks may be better able to time the issues of related firms.<sup>15</sup>

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<sup>15</sup> Or, if non-related investment banks have market timing ability, they may use it to increase *ex post* underpricing, to the detriment of issuers.

Because we use market run-up as a control variable in subsequent empirical analysis, it is important to recognize that the analysis masks this possible benefit of using a related investment bank.

Consistent with the hypothesis that banking relationships increase capital market access for small firms, the market share evidence shows, generally, that when issuers use non-related investment banks, they tend to select investment banks with high market shares. In the auction regime, 259 issuers (80.7 percent) used major investment banks. Had all issuers used their related investment banks, only 101 issues (31.5 percent) would have been underwritten by majors. In the book-building regime, the shift was to 131 issues (80.4 percent) from a default level of 39 issues (23.9 percent). Consistent with this, issuers who used related investment banks were significantly more likely to be related to major underwriters.

“Default Major Underwriter” is a binary variable that equals 1 if the issuer is related to an investment bank that is classified as a major underwriter; the variable equals 0 if the issuer’s main bank does not have an existing relationship with a major underwriter.<sup>16</sup> The table shows that, during the auction regime, 62.2 percent of those issuing firms that selected a related investment bank were affiliated with a major investment bank; however, only 26.4 percent of those that selected a non-related investment bank were affiliated with a major investment bank. A similar pattern emerges during the book-building regime. The results suggest that the choice to use a non-related investment bank stems from the firm not having a relationship to a major underwriter.

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<sup>16</sup> If the main bank is related to both a major and a non-major investment bank, we classify the issuer as having a default major underwriter. This classification only applies to issuers whose main bank is Sakura, as Sakura Bank is affiliated with both Nomura (major) and Kokusai (non-major). In the auction regime, none of the firms that had Sakura as a main bank used Kokusai as the investment bank. In the book-building regime, one issuing firm, with Sakura as its main bank, elected to use Kokusai.

Also, if a firm uses a non-related investment bank, that investment bank is more likely to be a major underwriter. For example, in the auction regime, in 83.7 percent of the IPOs where issuers used non-related investment banks, the investment bank was a major underwriter; whereas in only 62.2 percent of the IPOs where issuers used related investment banks was the investment bank a major underwriter. The patterns are similar, but less significant in the book-building regime.

Several results from the “Issue Details” panel of Table 3 suggest that related investment banks facilitate equity market access for smaller firms making smaller offers, especially during the book-building regime. Also, issuers located in non-money center prefectures, characterized by low IPO activity, are more likely to select non-related investment banks in both regimes. The weaker relationships to various issue details during the auction regime are consistent with the more limited role of the underwriter in the auction regime. Issuers related to their investment banks are older in both regimes. It appears that firm age is associated with traditional-economy firms, where traditional *keiretsu* relationships may be stronger. Older firms tend to be in manufacturing and transportation industries and younger firms tend to be in the services, commercial, and financial industries.

Next, in Table 3 we report mean and median JASDAQ-adjusted returns for one- and 12-month intervals after the IPO. The differences in one-month returns are not significant for either regime. We use one-month returns as an indicator of whether a difference exists in the propensities for related and non-related investment banks to artificially support the issue prices. We examine returns over 12 months to test for the possibility that related investment banks are more likely to conceal negative information from investors and whether first aftermarket prices suggest that investors rationally provide for conflicts of interest in IPOs

underwritten by related investment banks. Differences in mean 12-month returns are not significant. There also are no material differences in median returns.

While these estimates suggest that investors are not misled into overvaluing issuers that employ related investment banks, the models do not directly examine the concern with self-dealing. Main banks could engage in self-dealing either by participating as a selling shareholder in the offerings or by causing primary proceeds to be used to redeem debt owed to the main bank. Although self-dealing that is anticipated by the market does not harm new investors in the issuer, it could, by transferring wealth from the issuer to the main bank, harm existing investors.

We examine the possibility of self-dealing by analyzing differences in the use of proceeds of issuers using related versus non-related investment banks. Table 3 shows the percentage allocations of total proceeds to secondary versus primary shares and the percentage allocations of primary proceeds to specific uses. We find no significant differences in either regime in the percentages of total proceeds allocated to secondary sales of shares. Nor, in either regime, are issuers who use related investment banks significantly more likely to use proceeds to redeem outstanding debt.<sup>17</sup>

***Use of Major and Non-major Investment Banks:*** As reported in Table 4, there are no significant differences in issue costs or market run-up for major versus other investment banks. The results intimate the importance of investment bank relationships: the information on “Related Investment Bank” shows that major investment banks are more likely to underwrite IPOs of non-related issuers in both regimes. To illustrate, during the auction regime, when the selected underwriter is *not* a major, the issuer and the investment bank are

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<sup>17</sup> We also estimated OLS models of the use of proceeds to redeem debt as functions of relationships to investment banks and the investment bank market share. None of these models produced significant results.

related 27.4 percent of the time. In contrast when the selected investment bank is a major, the issuer and selected investment bank are related only 10.8 percent of the time.

The difference in importance of the underwriter in the two regimes is suggested by the contrasting findings for percent of IPOs with default major underwriters. From the medians in Table 1, we know that smaller firms with smaller issues were more likely to issue during book building than auction, suggesting a more important information-production role for the main bank and suggesting that banking relationships are more important in the book-building regime. The results show that, during book building, when an issuer selects a major investment bank, 72.3 percent of the time the firm's default investment bank is a non-major (27.7 percent of the time the default is a major underwriter). In comparison, when an issuer selects a non-major, 90.9 percent of the time the default is a non-major. During this period, issuers tend to stay with their related underwriters even if the related underwriter is not a major. In contrast, during the auction regime, when an issuer selected a non-major underwriter, the default underwriter was a non-major 67.7 percent of the time (default major underwriter is 32.3 percent). Issuing firms selecting non-major underwriters were more likely to stay with their related bank in the book-building regime than in the auction regime. The latter result suggests that during the auction regime, banking relationships were less important for gaining capital market access. The issue details summarized in Table 4 provide additional evidence that larger firms with larger issues tend to engage major investment banks.

#### **B. Empirical Models of Investment Bank Relationship and Choice of Underwriter**

To better understand the determinants of issuer relationships to major investment banks, we present three regression models in Table 5. The dependent variable in the first (probit) model takes on the value of one if the issuing firm has a relationship with a major

investment bank. We include as independent variables: firm age, firm size (market capitalization), firm location (money center), and control variables for industry (the omitted category is real estate, construction, and other) and for the underwriting regime. Results indicate that issuers located in large money centers (Tokyo, Osaka, etc.) are more likely to have relationships with major underwriters. Except for the binary regime variable, other variables in the model are not statistically significant.<sup>18</sup>

The finding, that firms in more remote prefectures are less likely to have an existing relationship with a major underwriter, raises a question: how do remotely located firms gain access to equity capital markets? Do they rely on their existing banking relationships, or do they bypass the relationships and employ major investment banks? The second (probit) model in Table 5 examines whether the issuer employs a major investment bank. Independent variables include issue size (rather than market capitalization), an indicator for small banks that do not have main bank relationships, and industry control variables.<sup>19</sup> The results indicate that firms seeking to raise small amounts of equity are less likely to employ major underwriters and that firms in non-money centers are likely to employ a major underwriter (although the latter result is not statistically strong).

The third (OLS) model in Table 5 addresses the question of what factors influence an issuing firm's choice to either stay with their related investment bank or to switch underwriters? "Change to Major Underwriter" is a directional variable that takes on a value of 1, 0 or -1. The variable equals one if the issuer did not have a related major underwriter and switched to a major for the IPO; equals zero if the issuer did not change the size of the

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<sup>18</sup> We also examined the two regimes separately for the models in Table 5. Results were similar between regimes.

<sup>19</sup> In the first model in Table 5, we use firm size (market capitalization), not issue size, because firm size is theoretically more defensible as an exogenous variable to explain an existing relationship.



underwriter: it either had a related major underwriter and chose to use that underwriter or switched to another major, or had a related non-major underwriter and chose to use that underwriter or switched to another non-major; and equals minus one if the issuer had a related major underwriter and chose to use a non-major underwriter. The estimates show that issuers who are undertaking larger IPOs, those without main bank relationships to investment banks, and those located outside of major money centers, tend to switch to major investment banks. The finding that older firms are less likely to change banks is consistent with the view that *keiretsu* relationships are more important for more traditional firms.

In summary, Table 5 results suggest that the issuer's choice to use a related underwriter depends on size of the issue and on other incentives of the firm to change to a major underwriter. We use these findings in the subsequent section where we present tests of the conflict of interest hypothesis by estimating total issue cost and choice to use a related investment bank.

### **C. Empirical Models of Issue Cost and the Conflict of Interest Hypothesis**

We use two approaches to examine the effects of main bank relationships on access to equity capital markets and issue cost.<sup>20</sup> For each approach we estimate the model separately for both regimes and for the pooled data. The first is a simultaneous-equation system of total issue cost and the investment bank's relationship to the issuer. From this model, we find that the partial effect of the investment bank's relationship to the issuer is positively related to issue cost. However, the estimates of the investment bank relationship model indicate that issuers respond to expected high issue cost by selecting non-related investment banks. As the total issue cost models do not control for the issuer's ability to select a non-related investment

bank, they do not reveal whether, on net, issuers who use related investment banks are worse off. To assess the net effect of the investment bank relationship on total issue cost, we estimate an OLS model of total issue cost. We find that realized total issue cost is similar for issues involving related and non-related investment banks.

***Simultaneous Estimates of Total Issue Cost and Investment Bank Relationship:***

Table 6 shows the results of the simultaneous equation system. In the Total Issue Cost Model, we include as explanatory variables, the (simultaneously determined) choice to use a related investment bank, underwriter market share, and measures of firm age, issue size, market run-up, and one-month aftermarket return. Except for aftermarket return, we restrict the coefficients to be the same for related and non-related issues.

The coefficient on the “Related Investment Bank” variable reflects the partial effect of the relationship on total issue cost. Thus, it serves as a test of the investment bank’s effort to exploit a relationship by offering a noncompetitive total issue cost. As total issue cost is only observable after the offering, the issuer would perceive the underwriter’s effort to exploit its bargaining power in the form of a low valuation of the issuer’s shares and possibly (in the book-building regime) high fees for underwriting the issue. To test whether related investment banks attempt to exploit IPO investors by concealing negative information or otherwise inducing investors to over-value the shares of related issuers, we include an interaction of the related bank binary variable and the JASDAQ-adjusted one-month aftermarket return.

The coefficient on Related Investment Bank is positive in both regimes, though statistical significance levels are low. The results suggest that investment banks attempt to

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<sup>20</sup> We also estimated a Heckman model of the choice to use a related or non-related underwriter and of total issue cost, conditional on the choice. Because of the low numbers of observations of IPOs using related investment

underprice the IPOs of related issuers more than they would underprice the IPOs of non-related issuers. The positive coefficient on the interaction of relationship with one-month aftermarket return suggests that issues underwritten by related investment banks have more positive one-month returns than those underwritten by non-related investment banks. The result is inconsistent with the hypothesis that related investment banks successfully lead investors to overvalue the shares of related issuers. Rather, it appears that investors tend to undervalue the shares. However, the average difference is less than one-quarter of one percent and, the long-run median returns are virtually identical for related and non-related issues. Thus, undervaluation by investors does not appear to be economically significant. Other coefficients in the total issue cost model indicate that high-market share underwriters tend to underprice more, that firm age and issue size tend to reduce issue cost (as a percent of aftermarket value), and that issue cost is higher following a period of market run-up. In the model that combines both regimes, the book-building regime indicator variable shows that total issue cost is higher in the book-building regime.

In the Underwriter Affiliation Model of Table 6, the dependent variable takes on a value of one if the firm chooses to use a related underwriter. We include as explanatory variables, (simultaneously determined) total issue cost, the selected investment bank's market share of IPO underwriting during the regime, and a measure of issue size. While total issue cost is not observable prior to choosing an underwriter, we include it as a proxy for expected cost of the offering. Based on the results from Table 5, we also include the directional variable, Change to Major Underwriter. The expected sign of this variable is negative: those firms that are likely to employ a major investment bank for an IPO are less likely to rely on their related investment bank.

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banks, the self-selection coefficients were not statistically significant.

Results in the Underwriter Affiliation equation indicate that issuers select related underwriters when total issue cost is low, offsetting the underwriter's attempts to underprice IPOs of related issuers. The negative coefficient on Change to Major Underwriter indicates that issuers tend to use related underwriters unless they shift from a related non-major to a major underwriter. The coefficient on the Book-building Regime indicator, in the model that combines both regimes, indicates that issuers are more likely to use their related underwriter in the book-building regime. This is consistent with earlier discussions of the greater importance of investment bank relationships in the book-building regime.

***Ordinary Least Squares Estimates of Net Effects:*** Do issuers benefit by using related investment banks or are they harmed? Given the partial effects in Table 6, the answer is not clear. It appears that related investment banks attempt to exploit bargaining power, but issuers who are faced with such attempts, choose to use non-related investment banks. Table 7 reports the results of an ordinary least squares estimate of total issue cost. This model reveals the net effects of the investment bank's effort to exploit its bargaining power and the issuer's effort to shop for underwriting services. We find no significant difference between total issue cost of issues using related and non-related investment banks. The estimated partial effect of the relationship is near zero in both regimes. Thus, related issuers gain greater access but do not realize issue cost savings relative to using non-related investment banks. For completeness, Table 7 includes a probit model of the choice to employ a related underwriter. As expected, coefficients on total issue cost as an explanatory factor are weaker than when the system is estimated simultaneously.

## V. Conclusions

In this paper we study the role of commercial bank relationships in IPO underwriting. Among other issues, we are interested in whether such relationships increase access to equity capital markets. In summary, main bank relationships to investment banks are valuable to IPO issuers in Japan. Main bank lending relationships appear to give small firms, making small issues, greater access to equity capital markets than they would have if commercial banks and investment banks were not related. Large issuers whose main bank relationships are with small investment banks appear to be able to switch to large, non-related investment banks that are capable of managing larger offerings. Also, issuers located outside of major money centers, and those that do not have main bank relationships with investment banks, are more likely to use major investment banks.

The findings are important for policymakers who are concerned that close relationships between commercial banks and investment banks may result in conflicts of interest and self-dealing. Such problems are most acute when financial markets are under stress and for those securities subject to significant informational asymmetries, like IPOs. Yet, even under such conditions we find that issuing firms benefit from relationships to commercial banks that are affiliated with investment banks.

While we find evidence that related investment banks seek to exploit relationship-based bargaining power by charging higher fees and/or by underpricing more, our evidence indicates that the investment bank's bargaining power is limited and that issuers respond to high expected issue cost by using non-related investment banks. On average, holding other factors constant, issuers who use related banks have greater access to equity capital markets

and incur total issue costs that are comparable to those incurred by issuers who use non-related investment banks.

We find no significant evidence that IPOs underwritten by related investment banks are systematically over-valued by investors and no significant evidence that main banks attempt to exploit their relationships to issuers and underwriters by selling overvalued shares of issuers or using proceeds disproportionately to extinguish issuer's debt owed to the main bank.

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Table 1

### Summary Statistics for Issuing Firms and IPO Attributes

Sample means (medians) for 321 auction-method offerings and 163 book-building-method offerings by JASDAQ firms during 1995 through 1999.

Variable	Definition	Auction Regime	Book-building Regime	t-value
<b>Panel (a) Issuing Firm Characteristics</b>				
Firm Age	Age of firm in years, at time of issue	30.0 (29.9)	24.8 (23.3)	2.84***
Market Cap	Total shares outstanding x first aftermarket price, in millions of yen	20428 (11103)	34175 (8546)	-1.07
Commercial	Binary variable, equals 1 if a commercial enterprise	31.15%	30.06%	0.18
Manufacturing	Binary variable, equals 1 if a manufacturing enterprise	34.89%	30.67%	0.67
Service	Binary variable, equals 1 if a service enterprise	19.31%	23.93%	-0.83
Finance	Binary variable, equals 1 if financial enterprise	4.67%	1.23%	1.68*
Transportation	Binary variable, equals 1 if transportation enterprise	4.99%	3.07%	0.75
Other	Binary equals 1 if real estate, construction, mining	4.98%	9.82%	-1.36
Money Center	Number of firms in the issuing firm's prefecture that completed a JASDAQ IPO during the sample period	119.8 (33.0)	146.0 (241.0)	-1.75*
<b>Panel (b) Pre- and Post-IPO Performance</b>				
Runup 20	Run-up in the JASDAQ Index over 20 days prior to IPO	-2.4% (-3.3%)	3.8% (2.6%)	-5.50***
Runup 40	Run-up in the JASDAQ Index over 40 days prior to IPO	-3.8% (-4.9%)	6.7% (5.5%)	-6.00***
Return 1	Market-adjusted return over one month after IPO	-2.8% (-4.4%)	-8.4% (-10.4%)	1.44
Return 12	Market-adjusted return over 12 months after IPO	-1.8% (-9.7%)	6.0% (-30.9%)	-0.31
<b>Panel (c) Offer Characteristics</b>				
Issue Size	In millions of yen, based on offer price	2726.9 (1807.0)	2877.4 (1254.0)	-0.24
Total Issue Cost	Includes underwriting fees plus underpricing, as a percent of first aftermarket price	11.7% (9.8%)	28.0% (21.7%)	-5.93***
Working Capital	Percent of primary proceeds used for working capital	22.1% (0.0%)	21.8% (0.0%)	0.05
Long-term Investment	Percent of primary proceeds used for investment	38.4% (25.0%)	39.1% (17.1%)	-0.12
Repay Debt	Percent of primary proceeds used for debt repayment	34.3% (15.3%)	22.9% (0.0%)	2.28**
Other Use	Percent of primary proceeds used for other uses	5.3% (0.0%)	16.2% (0.0%)	-3.05***
<b>Panel (d) Relationships</b>				
Related I-Bank	Binary variable, equals 1 if issuing firm and investment bank share the same "main bank"	14.0 %	14.1%	-0.02
Major Underwriter	Binary variable, equals 1 if the investment bank has market share > 10%, based on share of IPO business over sample period	80.7%	80.4%	0.17

Data sources: IPO Prospectus and Research Group for Disclosure. Research Group for Disclosure identifies the main bank of the issuer based on the prospectus of the issuing firm. Stock prices are from Toyo-Keizai Stock Price Data.

\*\*\*significant at 1%; \*\* significant at 5%; \*significant at 10%.

Table 2

### Investment Bank and Main Bank Relationships

Table shows market shares of IPOs for investment banks, main banks, and for those IPOs conducted by an investment bank that has the same main bank as the issuing firm (related bank). Investment bank affiliations with main banks are identified on the basis of the main bank's ownership of investment bank equity. Research Group for Disclosure identifies issuing firm main banks based on credit relationships. The table includes all investment banks that underwrote IPOs during the period of study and all related main banks. A main bank can be related to more than one investment bank. All figures in are percentages based on 321 auction-method IPOs or 163 book-building-method IPOs.

Investment Bank	Main Bank	Auction Regime			Book-building Regime		
		I-Bank Market Share	Main Bank Market Share	Related Bank Market Share	I-Bank Market Share	Main Bank Market Share	Related Bank Market Share
Nomura Securities	Sakura Bank	32.7	8.1	2.5	33.1	6.1	2.5
Daiwa Securities	Sumitomo Bank	17.4	5.3	0.9	20.9	8.0	3.1
Nikko Securities	Bank of Tokyo-Mitsubishi	17.4	9.3	3.4	25.8	9.8	3.1
Yamaichi Securities	Fuji Bank	13.1	8.1	1.9	0.6	9.2	0.0
Kokusai Securities	Sakura Bank	4.7	8.1	0.0	6.7	6.1	0.6
Kankaku Securities	Dai-Ichi Kangyo Bank	5.0	10.9	3.4	2.5	15.3	2.5
New Japan Securities	Industrial Bank of Japan	2.2	1.6	0.0	4.9	1.8	1.2
Wako Securities	Industrial Bank of Japan	1.9	1.6	0.6	1.8	1.8	0.0
Dai-Ichi Securities	Long-Term Credit Bank	1.2	1.6	0.3	0.6	0.0	0.0
Sanyo Securities	Daiwa Bank	1.2	2.8	0.0	0.0	1.2	0.0
Universal Securities	Long-Term Credit Bank	0.9	1.6	0.0	0.0	0.0	0.0
Okasan Securities	Industrial Bank of Japan	0.9	1.6	0.0	0.0	1.8	0.0
Cosmo Securities	Daiwa Bank	0.6	2.8	0.3	0.6	1.2	0.6
Tokai Maruman Sec.	Tokai Bank	0.6	10.3	0.6	0.6	4.9	0.6
Ichiyoshi Securities	Sanwa Bank	0.0	5.9	0.0	1.2	11.7	0.0
Marusan Securities	Industrial Bank of Japan	0.0	1.6	0.0	0.6	1.8	0.0
None	Small Commercial Banks	0.0	35.5	0.0	0.0	31.9	0.0

#### Bank Mergers:

April 1996      Bank of Tokyo and Mitsubishi Bank formed Bank of Tokyo-Mitsubishi.  
 April 2001      Sumitomo Bank and Sakura Bank formed Mitsui Sumitomo Bank  
 January 2002    Sanwa Bank and Tokai Bank formed UFJ Bank  
 April 2002      Fuji Bank, Dai-Ichi Kangyo Bank and Industrial Bank of Japan formed Mizuho Bank

#### Financial Institution Bankruptcies:

Yamaichi Securities, Sanyo Securities, and Hokkaido Takusyoku Bank all filed in November 1997.

Table 3

### Comparative Statistics and Tests for IPOs Using Related and Non-Related Investment Banks

Comparisons of issue cost, underwriter market share, issue details, aftermarket performance, and allocation of proceeds for 321 auction regime, and 163 book-building regime IPOs, and for the combined sample of 484 IPOs. Table reports tests of differences in means between IPOs underwritten by related investment banks and by non-related investment banks. An investment bank is "related" to an issuer if the underwriter and the issuer share the same main bank. The "Underwriter Market Share" panel shows: 1) for those firms that select a related (non-related) investment bank: a) the average market share of the underwriter; b) percent of the deals done by a "major underwriter" (with a market share of 10% or more); and c) percent of the deals where the issuing firm is related to a major underwriter. "Default major underwriter" is a binary variable that equals 1 if the issuer is related (through a main bank) to an investment bank that is a major underwriter.

	Auction Regime			Book-building Regime			Combined
	Related I-Bank	Non-related I-Bank	t-value	Related I-Bank	Non-related I-Bank	t-value	t-value
<b>Issue Costs</b>							
Total Issue Cost	8.1%	12.3%	-1.50	20.3%	29.3%	-1.53	-198**
Underwriter Fees	3.2%	3.1%	1.47	4.7%	4.2%	1.34	1.49
Underpricing	3.2%	9.2%	-1.50	15.6%	25.1%	-1.52	-2.02**
Run-up 40	-6.1%	-3.4%	-1.51	0.4%	7.8%	-1.60	-2.11**
IPOs with Positive Run-up 40	17.8%	35.1%	-1.99**	47.8%	69.3%	-1.45	-2.36**
<b>Underwriter Market Share</b>							
Underwriter Market Share	14.3%	19.9%	-2.48**	17.1%	23.7%	-1.92*	-3.15***
Major Underwriter (% of obs)	62.2%	83.7%	-2.23**	60.9%	82.9%	-1.59	-2.79***
Default Major Underwriter (% of obs)	62.2%	26.4%	3.56***	65.2%	17.1%	3.54***	5.01***
<b>Issue Details</b>							
Firm Age	34.1	29.3	1.98**	29.6	24.1	1.33	2.37**
Market Cap (millions of yen)	17544	20688	-0.42	8566	38382	-2.25**	-1.74*
Shares Offered (thousands)	1258	1219	0.27	1029	1314	-1.82*	-0.62
Issue Size (millions of yen)	2448.0	2772.4	-0.58	1227.3	3148.4	-2.70***	-1.89*
Money Center	148	115	1.40	193	138	1.88*	2.19**
<b>Aftermarket Returns</b>							
1 Month Mean Return	-2.0%	-2.9%	0.21	-17.4%	-6.9%	-1.12	-0.70
1 Month Median Return	-4.6%	-4.3%		-22.7%	-9.3%		
12 Month Mean Return	-4.2%	-1.5%	-0.39	-42.8%	14.2%	-1.02	-1.10
12 Month Median Return	-13.5%	-8.8%		-29.9%	-31.5%		
<b>Allocation of Total Proceeds</b>							
Secondary Proceeds to Total	41.1%	40.3%	-0.24	34.3%	39.7%	0.87	0.40
<b>Allocation of Primary Proceeds</b>							
Working Capital	22.3%	22.0%	-0.38	12.5%	23.4%	1.21	0.62
Capital Investment	45.3%	37.3%	-0.93	47.9%	37.6%	-0.73	-1.20
Debt Retirement	29.7%	35.0%	0.64	24.2%	22.7%	-0.13	0.46
Other Unspecified Uses	2.7%	5.7%	0.89	15.4%	16.4%	0.10	0.55

\*\*\*significant at 1%; \*\* significant at 5%; \*significant at 10%.

Table 4

### Comparative Statistics and Tests for IPOs Using Major and Non-major Investment Banks

Comparisons of issue cost, underwriter market share, and issue details for 321 auction regime, and 163 book-building regime IPOs, and for the combined sample of 484 IPOs. The table reports tests for differences in means of IPOs underwritten by major investment banks and non-major investment banks, where a “major” has a market share of 10% or more. “Default major underwriter” is a binary variable that equals 1 if the issuer is related (through a main bank) to an investment bank that is a major underwriter.

	Auction Regime			Book-building Regime			Combined
	Major I-Bank	Other I-Bank	t-value	Major I-Bank	Other I-Bank	t-value	t-value
<b>Issue Costs</b>							
Total Issue Cost	12.1%	10.1%	0.80	28.8%	25.0%	0.53	0.76
Underwriter Fees	3.1%	3.1%	-0.55	4.3%	4.3%	-0.11	-0.38
Underpricing	9.0%	7.0%	0.79	24.5%	20.7%	0.51	0.75
Run-up 40	-3.6%	-4.5%	0.53	7.7%	3.0%	1.11	1.07
<b>Underwriter Market Share</b>							
Default Major Underwriter (% of obs.)	31.3%	32.3%	-0.11	27.7%	9.1%	2.04**	0.87
Related Investment Bank (% of obs.)	10.8%	27.4%	-2.16**	10.8%	27.3%	-1.54	-2.68***
<b>Issue Details</b>							
Firm Age	29.1	33.7	-2.02**	24.4	26.4	-0.56	-1.84*
Market Cap (millions of yen)	21809	13727	1.34	38540	16979	1.17	1.70
Shares Offered (thousands)	1270	1032	2.94***	1319	1093	1.10	2.64***
Issue Size (millions of yen)	2848.8	2218.0	1.24	3152.8	1792.2	1.21	1.73*
Money Center	115	139	-1.14	140	168	-0.97	-1.52
Small Commercial Bank	37.5%	27.4%	1.14	33.8%	24.2%	0.81	1.42

\*\*\*significant at 1%; \*\* significant at 5%; \*significant at 10%.

Table 5

### Regression Models of Issuer Relationships to Major Underwriter, Use of Major Underwriter, and Change to Major Underwriter for IPO Underwriting

Estimates are based on 484 IPOs, combining the auction and book-building regimes. The dependent variable in the first (probit) model is a binary variable: =1 if the issuer is related to a major underwriter through its main bank; 0 otherwise. The dependent variable in the second (probit) model is a binary variable: =1 if the issuer uses a major underwriter for its IPO underwriting; 0 otherwise. The dependent variable in the third (OLS) model, "Change to Major Underwriter," is a directional variable: =1 if the issuer did not have a related major underwriter and switched to a major; = 0 if the issuer did not change the size of the underwriter: it either had a related major underwriter and chose to use that underwriter or switched to another major, or had a related non-major underwriter and chose to use that underwriter or switched to another non-major; and = -1 if the issuer had a related major underwriter and chose to use a non-major underwriter.

	Issuer is Related to Major Underwriter		Issuer Uses a Major Underwriter		Change to Major Underwriter	
	Coef.	z-value	Coef.	z-value	Coef.	t-value
Firm Age (Ln years)	0.0950	0.80	-0.1934	-1.51	-0.0736	-1.68*
Market Cap (Ln thousands of yen)	0.0613	1.01				
Issue Size (Ln thousands of yen)			0.1719	2.16**	0.0454	1.66*
Small Commercial Bank			0.1610	1.01	0.4270	7.62***
Money Center	0.0039	6.51***	-0.0010	-1.50	-0.0008	-3.51***
Manufacturing	0.3525	1.16	-0.5365	-1.71*	-0.1978	-1.93*
Commercial	0.1723	0.56	-0.2704	-0.84	-0.0822	-0.81
Service	0.3055	0.97	-0.3718	-1.13	-0.1326	-1.24
Finance	0.2855	0.64	-0.1057	-0.21	-0.1663	-1.03
Transportation	0.2953	0.72	-0.1530	-0.34	-0.0931	-0.63
Book-building Regime	-0.2813	-1.98**	-0.0038	-0.02	0.0894	1.66*
Constant	-2.5755	-2.22**	-0.5241	-0.40	0.1606	0.36
Obs.	484		484		484	

\*\*\*significant at 1%; \*\* significant at 5%; \*significant at 10%.

Table 6

### Simultaneous Estimates of Total Issue Cost and Investment Bank Relationship

Two-stage least squares estimates of total issue cost and investment bank relationship to the issuer are based on 321 auction-regime IPOs and 163 book-building-regime IPOs, and on the combined sample. The dependent variable in the first equation is total issue cost as a percent of aftermarket value, and in the second equation is a binary variable: =1 if the issuer chooses to use a related investment bank; 0 otherwise. "Change to Major Underwriter" is a directional variable: =1 if the issuer did not have a related major underwriter and switched to a major; = 0 if the issuer did not change the size of the underwriter: it either had a related major underwriter and chose to use that underwriter or switched to another major, or had a related non-major underwriter and chose to use that underwriter or switched to another non-major; and = -1 if the issuer had a related major underwriter and chose to use a non-major underwriter.

	Auction Regime		Book-Building Regime		Both Regimes	
	Coef.	z-value	Coef.	z-value	Coef.	z-value
<b>Total Issue Cost Model</b>						
Related Investment Bank	0.1264	1.64*	0.1618	1.19	0.1568	2.06**
Underwriter Market Share (Pct)	0.0025	3.28***	-0.0000	-0.00	0.0014	1.80*
Firm Age (Ln years)	-0.0297	-1.92*	-0.1390	-5.34***	-0.0857	-5.81***
Issue Size (Ln thousands of yen)	-0.0141	-1.56	-0.0236	-1.58	-0.0165	-1.96**
Market Run-up (Day -40 to -1)	0.4736	5.68***	1.1345	9.70***	0.8862	12.40***
Aftermarket Return (Month 1)	-0.0183	-0.48	-0.0165	-0.31	0.0043	0.13
Related I-Bank*Aftermarket Ret.	0.2426	2.32**	0.2791	1.24	0.2127	1.90*
Book-Building Regime					0.0414	2.17**
Constant	0.3705	2.51**	0.9384	3.92***	0.6221	4.47***
<i>R-Squared</i>	0.39		0.44		0.35	
<b>Underwriter Affiliation Model</b>						
Total Issue Cost (Pct of Market)	-1.1343	-2.37**	-0.2727	-1.86*	-0.4883	-3.11***
Underwriter Market Share (Pct)	0.0031	1.30	0.0037	1.29	0.0019	1.10
Change to Major Underwriter	-0.1957	-5.19***	-0.3427	-6.20***	-0.2292	-7.52***
Firm Age (Ln years)	0.0537	1.41	0.0384	0.99	0.0334	1.21
Issue Size (Ln thousands of yen)	0.0019	0.08	-0.0279	-1.29	-0.0098	-0.59
Book-Building Regime					0.0945	2.33***
Constant	0.1048	0.26	0.6034	1.77*	0.3056	1.14
<i>R-Squared</i>	0.12		0.24		0.16	
Obs	321		163		484	

\*\*\*significant at 1%; \*\* significant at 5%; \*significant at 10%.

Table 7

### Ordinary Least Squares Estimates of Total Issue Cost and Probit Estimates of Investment Bank Relationship

OLS estimates of total issue cost and probit estimates of investment bank relationship to the issuer are based on 321 auction-regime IPOs and 163 book-building-regime IPOs, and on the combined sample. The dependent variable in the first model is total issue cost as a percent of aftermarket value, and in the second model is a binary variable: =1 if the issuer chooses to use a related investment bank; 0 otherwise. "Change to Major Underwriter" is a directional variable: =1 if the issuer did not have a related major underwriter and switched to a major; = 0 if the issuer did not change the size of the underwriter: it either had a related major underwriter and chose to use that underwriter or switched to another major, or had a related non-major underwriter and chose to use that underwriter or switched to another non-major; and = -1 if the issuer had a related major underwriter and chose to use a non-major underwriter.

	Auction Regime		Book-Building Regime		Both Regimes	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
<b>Total Issue Cost Model</b>						
Related Investment Bank	-0.0147	-0.79	0.0335	0.62	0.0039	0.18
Underwriter Market Share (Pct)	0.0018	2.91***	-0.0006	-0.37	0.0006	0.95
Firm Age (Ln years)	-0.0160	-1.27	-0.1315	-5.23***	-0.0728	-5.68***
Issue Size (Ln thousands of yen)	-0.0105	-1.27	-0.0243	-1.64*	-0.0149	-1.86*
Market Run-up (Day -40 to -1)	0.4081	5.77***	1.0847	10.12***	0.8207	13.18***
Aftermarket Return (Month 1)	-0.0002	-0.01	-0.0103	-0.20	0.0149	0.50
Related I-Bank*Aftermarket Ret.	0.1652	1.87*	0.1141	0.75	0.0973	1.20
Book-Building Regime					0.0534	3.05***
Constant	0.3049	2.29**	0.9578	3.98***	0.5906	4.46***
<i>Adjusted R-squared</i>	0.12		0.44		0.40	
	Coef.	z-value	Coef.	z-value	Coef.	z-value
<b>Underwriter Affiliation Model</b>						
Total Issue Cost (Pct of Market)	-1.4424	-1.87*	-0.3370	-0.52	-0.8729	-1.87*
Underwriter Market Share (Pct)	0.0065	0.61	0.0177	1.23	0.0083	0.96
Change to Major Underwriter	-0.9005	-4.75***	-1.9364	-4.78***	-1.1194	-6.71***
Firm Age (Ln years)	0.4386	1.89*	0.4500	1.59	0.3832	2.21**
Issue Size (Ln thousands of yen)	0.0245	0.19	-0.2212	-1.47	-0.0734	-0.79
Book-Building Regime					0.2703	1.41
Constant	-2.6118	-1.19	0.8892	0.37	-1.0675	-0.68
<i>Pseudo R-squared</i>	0.17		0.35		0.21	
Obs	321		163		484	

\*\*\*significant at 1%; \*\* significant at 5%; \*significant at 10%.