Investment-Banking Relationships: 1933-2007 *

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Abstract

We study the evolution of investment bank relationships with issuers from 1933–2007. The degree to which issuers conditioned upon prior relationship strength when selecting an investment bank declined steadily after the 1960s. The issuer's probability of selecting a bank with strong relationships with its competitors also declined after the 1970s. In contrast, issuers have placed an increasing emphasis upon the quantity and the quality of their investment bank's connections with other banks. We relate the structural changes in bank-client relationships beginning in the 1970s to technological changes that altered the institutional constraints under which security issuance occurs.

Our clients' interests always come first.[1]

1. Introduction

In the aftermath of the 2008 financial crisis, claims that investment banks placed their clients' interests first ring hollow and to many observers trust appears to be in short supply.[2] It is easy to imagine why this might be the case. Banks are well-informed relative to their clients, who hire them for their expertise and access to investor networks, and it is rarely possible to determine the counterfactual that would have arisen had the bank provided them with different advice.[3] Moreover, banks are conflicted by their ability to profit from abuse of client information and by favoring the counterparties to a client's transaction.[4] It is difficult for clients to observe how banks deal with such conflicts and the courts charged with adjudicating disputes are similarly challenged to verify the substance of complaints.

But these also are conditions under which a reputation for being trustworthy should be valuable. There was a time when bankers and their clients at least acted as if they trusted one another. For example, during the middle of the 20th century, investment banks and their clients often maintained exclusive relationships within which bankers regularly provided advisory services on the expectation of compensation from future underwriting mandates (Eccles and Crane 1988). In this paper we attempt to document how trust between investment banks and their clients has diminished and explain why this has happened.

Our first challenge is to measure changes in trust or the reputation concerns on which it rests. In the spirit of Klein and Leffler (1981), we argue that bank-client relationships can serve as a mechanism for sustaining trustworthy behavior. Repeated dealing enables clients to monitor behavior and withdraw from the relationship if they perceive a violation of trust. If the bank expects a rent stream from sustaining the relationship that exceeds the one-time benefits from violating the client's trust, it will

[1]The first of Goldman Sachs' 14 business principles. They were first enumerated by John Whitehead in the late 1970s and recently reaffirmed in the aftermath of the firm's $550 million settlement of the Securities and Exchange Commission's April 16, 2010 civil complaint in connection with the 2007 ABACUS transaction.

[2]For example, Alan Greenspan observed that "In a market system based on trust, reputation has a significant economic value. I am therefore distressed at how far we have let concern for reputation slip in recent years." (Markets and the Judiciary Conference', Georgetown University, October 2, 2008). Similarly, Paul Volcker commented that combining traditional banking functions with "a system of highly rewarded—very highly rewarded—impersonal trading dismissive of client relationships presents cultural conflicts that are hard — I think really impossible—to successfully reconcile within a single institution." (May 9, 2012 Statement to the Senate Banking Committee Subcommittee on Consumer Protection)

[3]See Admati and Pfleiderer (1990), Admati and Pfleiderer (1988), and Chen and Wilhelm (2012) on incentives for information production; Bolton, Freixas, and Shapiro (2007) and Chen, Morrison, and Wilhelm (2015) on conflicts stemming from banks being better able to judge the suitability of products or advice offered to their clients; Admati and Pfleiderer (1990), and Benveniste and Spindt (1989) and Sherman and Titman (2002) on banks acquiring information from insitutional investors.

[4]See Kang and Lowery (2014), Reuter (2006), Nimalendran, Ritter, and Zhang (2007) on conflicts stemming from institutional brokerage relationships; Asker and Ljungqvist (2010) on conflicts related to banks serving multiple clients within a product market; Bodnaruk, Massa, and Simonov (2007), Griffin, Shu, and Topaloglu (2012), and Jegadeesh and Tang (2010) on banks' ability to exploit information gained from advising M&A clients; and Mehran and Stulz (2007) for a broad review of the literature on conflicts of interest in financial institutions.

find the relationship worth protecting and thereby develop a reputation for placing the client's interests before its own. From this perspective, time variation in the state of a relationship can shed light on how reputation concerns have changed through time.

We study long-run changes in the state of banking relationship by constructing a hand-collected dataset containing all U.S. public and private underwritten securities transactions over $1 million from 1933–1969 to supplement post-1970 data compiled by Securities Data Corporation (SDC). We measure the state of a bank-client relationship at the point of a client's decision to issue new secruities as the bank's dollar share of the client's securities issued during the preceding 10 years. Using the average of this measure across clients in a given year, Figure 1 provides a snapshot of how the investment-banking relationships of three major banks as well as an average across the top 30 banks by market share evolved over our sample period.

The 1933 (Glass Steagall) Banking Act upset many existing client relationships as commercial banks withdrew from securities underwriting and individual bankers changed their affiliations.[5] Relationships then strengthened through the early part of the sample period in spite of further regulatory intervention aimed at weakening bank-client relationships. These efforts culminated with an unsuccessful antitrust complaint filed by the U.S. Justice Department in 1947 (*United States v. Henry S. Morgan et al.*).[6] By 1959 Goldman Sachs was responsible for about 98% of the proceeds raised during the preceding 10 years by the clients it represented in that year. The average degree of exclusivity among the top 30 banks in 1959 was over 80%. Merrill Lynch, a relative latecomer to the top ranks of securities underwriting, continued to strengthen its client relationships through the 1960s. However, for the most part, the state of client relationships leveled off or weakened during the 1960s before declining sharply during the 1970s and 1980s and, then again, during the 2000s. By 2009, the average client of the top 30 banks directed about 50% of its business during the preceding 10 years to the bank hired for the transaction at hand.

In section 2 we provide a detailed description of the data used to measure the state, or strength, of bank-client relationships, the state of a bank's relationships with a prospective client's competitors, banks' syndicate relationships with one another, and time variation in banker tenure and turnover. Existing research on investment-banking relationships uses measures similar to our measure of relationship strength to examine the influence of a relationship on the issuer's choice of a bank to lead its securities offering.[7] We follow this strategy in section 3 by developing a nested logit model of an issuer's bank choice conditional on the state of its existing relationships with the top 30 banks by market share as well as additional bank- and transaction-specific attributes. This enables us to measure how issuers conditioned their selection of an underwriter on the state of their banking relationships

[5]By the end of the 1920s two large commercial banks, Chase National and National City of New York, sponsored over half of all new securities offerings [Morrison and Wilhelm (2007, p. 210)].

[6]Morrison and Wilhelm (2007, Ch. 7)

[7]See Krigman, Shaw, and Womack (2001), Ljungqvist and Wilhelm (2005), Chitru, Gatchev, and Spindt (2005), Ljungqvist, Marston, and Wilhelm (2006, 2009), Yasuda (2005), Yasuda (2007), Schenone (2004), Benzoni and Schenone (2010), and Asker and Ljungqvist (2010).

and how their decision process changed through time.

The estimation results reported in Section 4 reveal that throughout the sample period issuers favored banks with whom they had strong relationships. This effect increased through the 1960s and declined thereafter. Consistent with the pattern illustrated in Figure 1, the largest absolute change in the coefficient estimate for the state of the issuer's relationship with the bank occurred from the 1960s to the 1970s. Choice probability elasticities with respect to the state of the issuer's relationship with a given bank in the choice set lend nuance to our findings. For example, we show that throughout the sample period, choice probabilities generally were less elastic among banks with greater market share. Among banks with exclusive relationships with the issuer at hand, choice probability elasticities increased markedly during the 1970s and 1980s before diminishing somewhat during the 2000s. In the context of exclusive relationships, where there is nothing further to gain, we interpret increasing elasticity as an indication that the foundations for trust were weakening even among the strongest bank-client relationships.

In Section 5 we consider alternative explanations for the time patterns yielded by our analysis of investment-banking relationships. The long time horizon over which these relationships evolved witnessed a good deal of change in financial markets and in the economy at large. No single event is likely to have caused the patterns we observe in the data. However, a substantial body of theory coupled with careful attention to the evolving institutional background can help us to sort through alternative explanations for our findings. In short, our analysis suggests that the seeds for the decline of trust between banks and their clients were sown earlier than is widely recognized and that technological change, not deregulation, was the earliest and perhaps the single most important force behind this change.

Our interpretation of the empirical results depends heavily on historical events that we reference throughout the paper. The appendix to the paper includes a discussion and timeline of the regulatory, institutional, and technological changes that are central to our analysis, additional descriptive data, and a detailed description of the pre-1970 data.

2. Data and Variable Construction

Details of securities offerings between 1933 and 1969 are obtained from two sources. Counsel for several defendants in *United States v. Henry S. Morgan, et al* assembled details of all *underwritten* issues of $\$1,000,000$ or more from July 26, 1933 to December 31, 1949.[8] The records were subsequently published in 1951 as *Issuer Summaries*.[9] Data for 1950s and 1960s deals were collected

[8] *United States v. Henry S. Morgan, et al., doing business as Morgan Stanley & Co.; et al, (Civil Action No. 43-757),* United States District Court for the Southern District of New York. Additional information related to the case is drawn either from the *Corrected Opinion of Judge Harold R. Medina* or from the Harold R. Medina Papers housed at the Mudd Library, Princeton University.

[9] Sullivan & Cromwell, *Issuer summaries; security issues in the United States, July 26, 1933 to December 31, 1949. Prepared by counsel for defendants in United States v. Henry S. Morgan, et al., doing business as Morgan Stanley & Co.; et al.* (Baker Old Class JS.065 U571h). For further discussion of the data and its collection, see the appendix to *Corrected*

from the *Investment Dealers' Digest*.[10] The Appendix provides a detailed description of the data and collection process for the 1933-1969 period. Data for issues between 1970 and 2007 were taken from the Thomson Reuters SDC database. To maintain continuity with the pre-1970 data, we exclude foreign exchange-listed issues, foreign-traded issues, and issues listed by non-US incorporated entities. SDC provides incomplete records for issues between 1970 and 1979. For example, there is no private placements data for this period; SDC was unable to provide more complete data.

It is worth noting that while there was little issuance activity until the end of 1934, it was then relatively strong as industrial demand rose and interest rates declined through 1949, "except for occasional falling off in the depression of 1937 and in the early years of World War II" (Medina 1954 [1975], p. 40). Judge Medina notes further that "an issue of $\$5,000,000$ was considered small" during this period.[11] In other words, although there is greater absolute dispersion in transaction size over time, our sample includes both large and small transactions over the entire sample period.

The full sample dataset (1933–2007) contains 287,332 underwritten transactions. To ensure consistency with the related literature, we exclude issues by financial institutions (SIC codes 6000–6999), government and public bodies (SIC codes 9000–9999), agricultural and natural resources companies (SIC codes 0–1499), electric, gas, and sanitary services companies (SIC codes 4900–4999), pipelines other than natural gas (SIC codes 4611–4619), and the United States Postal Service (SIC code 4311).[12]

For the post-1969 period, for which we have more complete information, we make some additional exclusions. Deals for which the underwriter is recorded as "No Underwriter" or "Not Available" are excluded; so are issues by funds, depositaries, leveraged buyout deals, issues by limited partnerships, rights issues, unit issues, regulation S issues, World Bank issues, and self-funded issues.

Finally, we include only straight equity issues that are classified as common, ordinary, cumulative, or capital shares. We retain only those preferred deals that are identified in the source data as cumulative, convertible, capital, or certificate. We exclude floating, indexed, reset, serial, and variable coupon debt issues, and retain other debt deals only if they are classified as bonds, debentures, notes, or certificates, and if they have a maturity of at least two years. These exclusions trim the sample to 63,302 transactions.

2.1. Long-Horizon Sample Problems

Tracking and analyzing bank-client relationships over a very long horizon presents two significant problems. First, the choice model that we estimate assumes that issuers select an underwriter from a

Opinion of Judge Harold R. Medina.

[10]Investment Dealers' Digest, Corporate Financing, 1950-1960, 1961; Investment Dealers' Digest, Corporate Financing, 1960-1969.

[11]There were 155 issues that raised at least $\$50,000,000$; 559 that raised at least $\$20,000,000$; and over $1,000$ that raised at least $\$10,000,000$ (Medina 1954 [1975], p. 40).

[12]We also exclude deals whose industry was recorded as "Other Finance," "REIT," "Real Estate," "Investment Bank," "S&L/Thrift," "Investment Fund," "Mortgage Bank," "Agriculture," "Fedl Credit Agcy," "Gas Distribution," "Natural Resource," "Oil/Gas Pipeline," or "Water Supply."

fixed set of banks determined by market share ranking. But banks rise and fall in the rankings through time and so we cannot hold the choice set fixed over the entire sample period.

Second, and related to this problem, although many of the major banks were very long-lived, some discontinued their operations and others were acquired. In the case of acquisitions, we need to allow for relationships that are passed along to the acquiring bank. In the following subsections, we explain how we address these problems.

2.1.1. The Issuer's Bank Choice Set

Our econometric analysis involves the estimation of bank choice models for seven time periods that, with the exception of the first, correspond to decades. We use the 1933-1942 time window to seed several of the variables described below. For each subsequent time period, we fix the issuer's choice set for a given transaction equal to the top 30 banks ranked by the dollar volume of transactions for which they served as the lead manager *during the decade in which the transaction took place*. Table A.I in the Appendix includes a list of the 30 banks that appear in each decade's choice set and their market share during the decade. The market share accounted for by the top 30 banks ranges from 88% during the 1940s to 96% in the 2000s.

It is important to note that we stratify the full sample period only because we cannot hold the bank choice set constant over the entire sample period. Although decades roughly correspond with the timing of some important changes in the market environment, their endpoints are not intended to identify regime shifts nor do we believe that attempting to identify regime shifts statistically would be a meaningful exercise. As we point out later, there were many forces at play over this time period, and few, if any, could be meaningfully said to have had a discrete effect on bank-client relationships within a narrow time frame.

The construction of the bank choice set excludes transactions managed by banks outside of the top 30 in a given decade. We also exclude transactions for which the issuer's SIC code was unavailable. These restrictions yield a final sample of 33,577 transactions for use in the econometric analysis. Table I reports the distribution of transactions in total and by type across the estimation periods. The number of transactions per estimation period ranges from a minimum of 842 for the 1943-1949 sample to a maximum of 12,574 for the 1990-1999 sample. Debt issues substantially outnumber equity (and preferred) issues in every estimation period. Over the entire sample period, debt, equity, and preferred issues accounted for 64%, 31%, and 5% of the sample of transactions. The percentage of transactions carried out by issuers that did no business with a bank in its choice set during the preceding 10 years ranged from 21% during the 1950-1959 estimation period to 48% during the 1970-1979 estimation period. Generally, equity issuers were less likely than debt issuers to have dealt with a bank in their choice set during the preceding ten years.

2.1.2. Bank Lifelines

Throughout the sample period, banks and issuers changed their names and merged. It follows that the names that banks and issuers had when deals were brought to market cannot form the basis of a meaningful analysis of relationships. In order to track the fortunes of major banks throughout the entire sample period, we define a bank's *lifeline*. In line with Ljungqvist, Marston, and Wilhelm (2006, 2009), we define a bank's lifeline at a particular date to comprise the names of all of the institutions that were merged into, or that were acquired by, the bank prior to that date. The bank's lifeline ends either when it fails, or when it is absorbed into another bank. Each lifeline is given a name, which we use in place of the specific name of a bank whenever it is used in our analysis as a member of the lifeline.

For example, Merrill Lynch acquired Goodbody in 1970 and White, Weld in 1978. The acquired firms' lifelines terminate when they are merged with Merrill, and subsequent deals are assigned to the Merrill timeline. Whenever two banks combine it is necessary to judge which of their lifelines should end, and which should continue. The decision is easy when the combined entity takes the name of one of the banks. On other occasions, we assign the combined institution to the lifeline that we believe to represent the more significant investment banking house. For example, after 2008 we assign Bank of America Merrill Lynch to the "Merrill Lynch" lifeline.

2.2. Variable Selection and Construction

The nested logit model treats each issuer as conditioning its bank choice on both bank-specific and transaction-specific attributes. In broad terms, we think of bank-specific attributes as reflections of bank behavior and capabilities. Other things equal, we expect issuers to prefer more trustworthy and more capable bank(er)s. In practice, a bank's capabilities reflect both its own resources and its ability to assemble resources for the transaction at hand via its syndicate connections. We think of transaction-specific attributes as reflections of the degree of risk or asymmetric information presented by different issuers and transaction types. As we note below, the literature suggests an element of matching between issuers and banks along this dimension.

Our selection of variables to proxy for bank-specific and transaction-specific attributes reflect two considerations. First, we have sought to include variables that have proven to have explanatory power in existing research on issuers' choices. However, our interest in maintaining consistency in the model specification across the entire sample period imposes some limitations.

We use the final-stage, bank-choice specifications in Ljungqvist, Marston, and Wilhelm (2006, 2009) as our guide. Our primary shortcoming relative to this benchmark is the inability to measure analyst behavior and bank lending across the entire sample period. We do not believe that this is a serious limitation. Lending capacity and analyst coverage are significant elements of investment-banking relationships only during the last two decades of our sample period – the time period covered by the

existing literature. The main contribution of our paper is the documentation and explanation for how investment-banking relationships reached the point at which they have been studied in the literature. Moreover, the measure of a bank's syndicate connections described below appears to embody this change in the menu of bank capabilities that issuers consider when they select a bank.

In the remainder of this subsection we decribe the motivation for each bank-specific and transaction-specific variable and how it is measured.

2.2.1. Bank-Specific Attributes: Relationship Strength

Our proxy for the strength or state of a banking relationship, *RelStr*, is the bank's dollar share of securities that the client issued over the preceding 10 year window. More precisely, the relationship strength for any bank and any issuer is calculated on a given date D as follows. First, we calculate the total dollar quantity Q of proceeds raised by any firm in the issuer's corporate family during the ten years prior to D. Second, the total amount A lead managed for the firm's corporate family by a member of the bank's date D lifeline is computed. The strength of the relationship between the bank and the company at date D is defined to be the ratio of A to Q. Using a similar measure, Ljungqvist, Marston, and Wilhelm (2006, 2009) document a strong influence of the state of bank-client relationships on the selection of lead managers and co-managers for both debt and equity issues brought to market from 1993-2002.

This measure of the state of a bank-client relationship is intended to reflect the spirit of models of bilateral-contract enforcement in repeated games. From this perspective, the bank is presumed trustworthy until proven otherwise and behaves accordingly to protect a rent stream from repeated dealing with the client. In doing so, the bank sustains a reputation for placing the client's interests before its own. The client is willing to pay the price premium to sustain good behavior. A perceived violation of trust results in a loss of reputation and the associated rent stream. The cost of preserving good behavior embodied in the rent stream is thus a reflection of the one-time gain received by the bank from violating the client's trust.[13] Alternatively, when the issuer perceives the bank as having met its expectations, we think of a bank as having sustained a reputation for trustworthy behavior toward the issuer and the state of the relationship as being strong. Other things equal, we expect the issuer to be more likely to preserve a strong relationship by selecting the bank for the transaction at hand.

Traditional measures of reputation in the investment-banking literature focus on bank market share (Megginson and Weiss 1991) and tombstone rankings (Carter and Manaster 1990). While these measures are useful proxies for a market-wide reputation, neither has the relationship-specific interpretation that we seek here. We do not wish to suggest that banks' reputation concerns are strictly bilateral. Unlike typical consumer transactions, securities transactions are often highly visible. To the extent

[13]See MacLeod (2007) for a review of the literature on informal enforcement that relates the (bilateral) relational contracting literature to the seminal work of Klein and Leffler (1981). In the Klein and Lefflert model, a seller makes quality decisions in an economy consisting of multiple consumers who costlessly communicate with one another. A violation of trust with one consumer thus destroys the seller's reputation with all consumers.

that this increases the threat of community punishment through damage to a market-wide reputation, the burden of sustaining bilateral trust faced by an individual client could be diminished.[14] With this in mind, we have also included each bank's market share during the year of a transaction as an additional bank-specific variable in some specifications of our models.

Figure 1 provided an overview of time variation in *RelStr* for Goldman Sachs, Merrill Lynch, and Morgan Stanley. Table II presents snapshots of client relationships for each of the top 30 banks by market share for the periods 1933–1969 and 1970–2007. For each bank, the table reports the number of clients for which it managed securities offerings, the percentage of clients with which its relationships was exclusive, and the fraction of all of its clients' transactions by value for which the bank was the lead manager. Proceeds from transactions with multiple bookrunners are apportioned equally among the bookrunners.[15] Table II reveals that bank-client relationships during the 1933–69 period were very different from those examined in previous research using SDC data. During the first half of our sample period, 53% of all client relationships among the top 30 banks were exclusive; in those relationships, one bank *managed every deal* that the issuer brought to market during the 38-year interval. This figure dropped to "only" 34% during the second half of the sample period. There is a larger drop, from 39% to 16%, in the mean fraction of all client underwriting proceeds for which a each bank had management responsibility. This decline is due, in no small part, to the reentry during the 1990s and 2000s of commercial banks into securities underwriting. Our underwriting measure ascribes no initial (underwriting) relationships to those banks, but many of them rapidly built underwriting relationships on the bank of existing (but unmeasured) lending relationships.

2.2.2. Bank-Specific Attributes: Relationship Strength within Industry Groups

A bank's capabilities include industry-specific expertise achieved by having performed deals in the current issuer's industry. We proxy for a bank's expertise in the issuer's industry with a measure of that bank's relationships with other firms in that industry. We identify industry by four-digit SIC code. Starting in 1944, we compute a measure *RelStrSIC* of industry expertise for each bank in the issuer's choice set as follows. Banks that managed deals for one or fewer firms in a given SIC code in the previous ten years are assigned a zero *RelStrSIC*. If a bank managed at least one deal for more than one firm in the preceding ten years then we compute the average *RelStr* index of section 2.2.1 across each of those firms, and assign that average to *RelStrSIC*.

[14] The literature usually interprets these measures as a reflection of a bank's capacity for producing information about the issuer and certifying the quality of its securities but it does not associate this function with repeated dealing between banks and issuers. See Booth and Smith (1986), Titman and Trueman (1986), Carter and Manaster (1990), and Chemmanur and Fulghieri (1994). This function is identified with repeated dealing in the literature on (commercial) bank lending relationships. Although there are similarities between commercial- and investment-banking relationships (Boot 2000), traditional lending relationships generally are not subject to the severe conflicts of interest motivating our analysis.

[15] We use the terms "lead underwriter," "lead manager," and "bookrunner" interchangeably and distinguish them from co-manager with equal apportionment of proceeds. The presence of co-managers and multiple bookrunners is largely a post-1990 phenomenon.

Using a 5-year rolling window, Asker and Ljungqvist (2010) show that the fraction of banks with multiple equity (debt) issuance relationships with the three largest firms within an SIC category rarely exceeds 5% (10%) over the 1975-2003 period. Extended to the 10 largest firms in an SIC category, the fraction of banks with multiple equity relationships rises above 10% only after 2001. Similarly, the fraction of banks with multiple debt relationships does not exceed 20% before 2001.

We cast a wider net than Asker and Ljungqvist because we consider *all* issuers within an SIC category. Figure 2 reveals that, after 1980, the fraction of banks with multiple equity relationships exceeded 15% (peaking at 37% in 2001), and often exceeded the fraction of banks with multiple debt relationships. More striking from our perspective is the sharp decline through the 1960s in the relative frequency of banks with multiple relationships within an SIC category. Prior to 1960, the fraction of banks with multiple relationships across issue types hovered between 18 and 20%.[16] The pre-1960 peak was not surpassed until 1985.

Asker and Ljungqvist (2010) argue that issuers prefer not to engage banks that work with their competitors for fear that strategic information about the issuer may leak. If this concern arises across our entire sample period, issuers must trade off industry expertise, as witnessed by a high level of *RelStrSIC*, against exposure to any conflicts that might arise from retaining a bank that works with their competitors. To the extent that *RelStr* does not control for concern for such conflicts, the coefficients that we estimate for *RelStrSIC* will reflect the *net* impact of these effects upon issuer decisions.

2.2.3. Bank-Specific Attributes: Syndicate Connections

In addition to industry expertise, issuers account for the broad range of services that the investment bank supplies when it serves as underwriter. The bank may supply these services directly or indirectly via the underwriting and selling syndicates that it assembles for the transaction. These services include pricing and distribution, market making, analyst coverage, and lending capacity.[17] We cannot directly and independently measure the ability to provide these services over our entire sample period; we therefore develop a proxy for the quality of the bundle of syndicate services that an issuer expects a lead underwriter to deliver by virtue of the quantity and quality of the banks with which it maintains syndicate relationships.

We use graph-theoretic techniques to quantify the quality of the bank's syndicate relationships.[18]

[16]The low relative frequency of multiple equity relationships during this period is, in part, a reflection of the low frequency of equity issuance within many SIC categories that more frequently yielded a single bank appearing in the SIC category dealing with a single issuer. For the 1944–1969 period, breaking the sample into year/SIC code pairs for which the number of banks with at least one relationship within the SIC category is less than 5 or greater than or equal to 5, yields 8% (28%) of banks in the former (latter) category with multiple relationships. For the 1970-2007 period, year/SIC code pairs with fewer than (greater than or equal to) 5 banks with one or more relationships average about 9% (41%) with multiple relationships.

[17]See Corwin and Schultz (2005) for a detailed discussion of the functions carried out by modern underwriting syndicates.

[18]All of our network calculations were performed using the Stanford Network Analysis Platform (SNAP, available from http://snap.stanford.edu/), a C++ library for performing network and graph-theoretic calculations.

Each year, we create a graph in which every bank in our dataset forms a node. An edge connects two banks in the graph if, at any time in the previous five years, one of the banks invited the other to be a co-manager in an underwriting syndicate for which it was a lead manager. For each bank in the graph we calculate a standard graph-theoretic measure of network connectedness called eigenvector centrality (*EVC*).[19] Eigenvector centrality accounts both for the number of relationships that a bank has, and for the quality of those relationships as reflected by a bank's market share.[20] Hence, a bank that is connected to bulge-bracket investment banks is regarded as better connected than a bank whose network comprises smaller, less-significant players. The formal definition of eigenvector centrality appears in the Appendix.

Figure 3 plots *EVC* (normalized to lie between 0 and 100) against the total underwriting proceeds managed by every bank in our database for the 1950–1955 and 2000–2005 time periods. In both cases, we label some of the points that correspond to particularly significant banks. The most striking feature of Figure 3 is that very profitable and reputable banks in the middle of the twentieth century were not necessarily closely connected to their peers. Morgan Stanley generated the highest underwriting proceeds over this period yet it maintained few connections with other well-placed firms. Indeed, the firm was noted for its unwillingness to share business.[21] Halsey, Stuart & Co. also had a low EVC and high underwriting proceeds over this period. However, it was very different to Morgan Stanley in that it was an aggressive bidder for competitive tenders, by which it hoped to destroy existing bank-client relationships (Chernow 1990, pp. 506, 623); as shown in Table III, it maintained relatively weak relationships with its clients. In contrast, Morgan Stanley was a strong defender of traditional, negotiation-based modes of doing business during this period and its client relationships were among the strongest.[22] Morgan Stanley's low connectedness appears to reflect a strong reputation and an excellent client network, while Halsey, Stuart's low connectedness was evidence of the opposite qualities. By the end of the sample period, there is a much stronger positive relation between *EVC* and underwriting market share. Moreover, the major commercial banks, in spite of having entered the securities markets relatively recently, were well-connected with their peers.

It is plausible that syndication weakens the immediate gains from a competitive advantage in one or more of the services for which we envision *EVC* serving as a proxy. For example, in the early part

[19]Note that, although we use *EVC* for only the 30 banks in the choice set, it is calculated using a graph that encompasses every bank in our dataset. For the 30 banks in the choice set, *EVC* therefore measures connectedness to banks inside and outside the choice set.

[20]See Bonacich (1972) for development of the eigenvector centrality measure and Podolny (1993) for an early application to investment-banking syndicates. Ljungqvist et. al. (2009) report that strong syndicate connections over the 1993-2002 period weakly strengthened a bank's bid for lead management (and only for debt offerings) but they find stronger evidence of a positive effect on the likelihood of being appointed a co-manager. Hochberg, Ljungqvist, and Lu (2007) report that funds run by better-networked venture capital firms perform better than their peers and that their portfolio companies are more likely to gain subsequent financing and achieve a successful exit. Hochberg, Ljungqvist, and Lu (2010) show further that strong local venture capital networks pose a barrier to entry for nonlocal venture capitalists.

[21]As late as the 1970s, Morgan Stanley was seen as lacking distribution capacity and thus, in this respect, dependent on other, usually less prestigious, syndicate members. The firm diluted the power of individual members by working with "up to two hundred firms" in its syndicates (Chernow, 1990, p. 624).

[22]See, for example, "Open clash seen in underwriting," Howard W. Calkins, *New York Times*, 7 September 1941.

of our sample period, Merrill Lynch had, by far, the largest and most sophisticated retail brokerage network whereas Morgan Stanley and Kuhn Loeb had none. And yet Merrill Lynch remained a second tier bank through the 1960s (see Table A.I). Moreover, to the extent that many banks were similarly able, via syndication, to assemble the capabilities necessary for a transaction, individual banks would be close substitutes along this dimension and, hence, *EVC* would have little explanatory power in our model. We return to this point when we discuss the results from estimating the bank-choice model.

2.2.4. Bank-Specific Attributes: Banker Stability

Personal relationships lie at the root of bank-client relationships. Presumably, a stable relationship between one or a few people from each of the bank and client firm would be more supportive of trust. Ideally, we would track the identities of the individuals responsible for a bank-client relationship. Although we cannot identify the individual bankers and issuer representatives associated with each client relationship in our sample, for a subset of banks we have identified the senior bankers most likely to be responsible for relationship management.[23] We use New York Stock Exchange member firm directories to collect annual data through 1989 on the identities of partners (or of their post-IPO analogs) for eight banks that includes both banks with strong retail networks (Dean Witter, E.F. Hutton, Merrill Lynch, Smith Barney) and those more focused in wholesale institutional operations (Goldman Sachs, Lehman Brothers, Morgan Stanley, Salomon Brothers).[24] We use this data to develop two proxies for the stability of interpersonal relationships.

In any given year, we measure the number of years since a banker was admitted to the partnership. At the start of each year we compute the total number of years served by the bank's partners. We then compute the percentage change in this figure each year. Our first proxy, *Tenure*, is a three year moving average of this percentage change; the moving average smooths the effect of discreteness in the length of partnership agreements that determined when partners left and new ones were appointed.[25]

Tenure could decline when the partnership expands through the appointment of new partners, even when senior partners do not retire. Hayes (1971, p. 147) notes that, following the great depression, investment banks did relatively little hiring before the early 1960s but banks subsequently replaced a generation of retiring bankers while also scaling up their operations at a rapid pace.[26] Thus we develop a second measure, *Experience*, designed to reflect years of experience *lost* during a given year. We

[23]With that said, in Appendix Section 7.4 we describe the experience from 1935-1950 of 17 banks for which we can identify both the partners who served as board members for client firms and the senior officers of those firms. Table A.IV provides data on 83 bankers who held 162 board seats during this period for an average of 13 years.

[24]For most of these and other NYSE member firms for which we have gathered data, there is a close mapping of pre-IPO partners into the identities of post-IPO senior officers through the 1980s.

[25]Goldman Sachs, for example, renewed its partnership agreement on a 2-year cycle. Unfortunately, we do not have access to records of the partnership cycle for most banks. However, cyclicality in partner admission and departure is clear in the raw data.

[26]As we discuss below, this generational turnover also deemphasized social connections in favor of technical skills. Morrison and Wilhelm (2008, p. 341) note that only 8% of Harvard's MBA class of 1965 accepted jobs in investment banking while 21% did so in 1969 and 29% in 1989.

calculate *Experience* by, first, computing each year the total number of years of experience lost by departures from the partnership, as a percentage of the total number of years served by remaining partners and then calculate the three-year moving average of that figure.

Figure 4 shows the average values of *Tenure* and *Experience* across the eight-bank subsample. During the early part of our sample period, bankers generally spent their entire careers with a single, typically quite small, banking partnership. For example, Goldman Sachs had 5 partners in 1934. *On average*, members of this cohort spent 37 years as partners in the firm. As we note in Appendix Section 7.4, at least 3 of these partners served as director for a number of client firms, in some instances serving for more than 30 years. Goldman's experience was not unique and as a consequence, except in the early 1940s when many bank partners left to join the war effort, average partner tenure increased through 1958. Similarly, the loss of partner experience was modest and relatively stable through the mid 1950s.

By the late 1950s, we begin to see signs of bankers having shorter tenures with a single firm and increasing loss of experience. The average partner in the 1956 cohort, when Goldman added 3 new partners to the existing 13-man partnership, served 26 years as a partner over the course of his career – down 11 years from the 1934 cohort. Each measure reached its extreme value around 1970 and they remained quite volatile through the 1980s. Returning to the experience of Goldman Sachs, in 1984, 17 partners with 226 years of partnership tenure (a 13 year average per partner) retired from the firm. A 25-member cohort of new partners joined 64 remaining partners leaving the firm with an average partner tenure of 7 years.

2.2.5. Transaction-Specific Attributes

We include three transaction-specific variables in our econometric analysis: an indicator for whether the transaction was an equity issue (*Equity*), the log of the dollar value of proceeds raised (*Log Deal Value*), and the number of the issuer's transactions between 1933 and the present transaction (*Deals to Date*). Each variable is intended to control for the characteristics of the issuer or the transaction at hand. Other things equal, we expect equity issues to be subject to more severe informational frictions. If the more challenging certification problems of equity underwriting also expose banks to greater reputational risk, then more reputable banks may be relatively less inclined to "match" with equity issuers (Carter and Manaster 1990, Chemmanur and Fulghieri 1994, Chitru, Gatchev, and Spindt 2005).

We expect informational frictions to be weaker among firms that are more mature and more frequent participants in the capital markets. We conjecture that information about large firms is more widely disseminated and include *Log Deal Value* as a proxy for firm size. Finally, given the prohibitive cost of tracking firm age, we use *Deals to Date* as a proxy for this attribute and expect informational friction to be smaller among firms that have done more deals prior to the transaction at hand to present less informational friction. But note also that if past issuance activity is perceived as an indicator of future activity, then more active issuer's might also have greater capacity for sustaining a rent stream

sufficient to support trustworthy behavior.

2.3. Summary Statistics

Table III reports summary statistics for the primary bank-specific and transaction-specific variables used in the full-sample nested-logit model. For estimation purposes, *RelStr*, *RelStrSIC*, and *EVC* have been normalized to a 0-100 scale. We report each variable by time period and, for the bank-specific variables, conditional on whether or not the bank was selected from the issuer's choice set. For example, during the 1943-1949 period, the client's mean relationship strength with the bank it chose to manage its transaction was 32.79. In other words, on average, banks selected to manage transactions during this time period had management responsibility for about 33% of the issuer's proceeds from transactions executed during the ten years preceding the transaction at hand. By contrast, banks within the choice set that were not selected to manage a transaction accounted for about 1% of the issuer's proceeds during the preceding ten years. The difference in means is statistically significant at the 1% level. The difference in means increased during the 1950-1959 period and then decreased every period thereafter. In every period the difference in means is statistically significant.

Table III also reveals that banks selected to manage deals generally maintained (statistically) stronger relationships with other firms in the issuer's 4-digit SIC category. The difference is statistically significant during the 1950s, 1960s, and 1980s. On average, banks selected by issuers also were better connected with their peers across the entire sample period. In absolute terms, differences in *EVC* across banks selected by the issuer and those that were not are considerably smaller than for the relationship variables but they are statistically significant during every decade but for 1943-1949. In further contrast, the mean levels for *EVC* for both bank types are relatively stable through time. Finally, on average, issuers selected higher-ranking banks (with lower mean rank values). Thus the average rank for banks that were not selected is centered slightly below the midpoint of the ranking scale.

Turning to the transaction-specific variables, equity issues ranged from 14.73% of sample transactions during the 1950s to 43% during the 2000s. The average transaction value was substantially larger from 1970 forward while the average number of an issuer's transactions from 1933 to the present (*Deals to Date*) declined sharply during the 1970s and 1980s. This shift reflects the first appearance of IPOs in our estimation samples. We provide further details and examine the sensitivity of our results to this change in Section 4.

3. The Bank Choice Model

We use the McFadden (1973) conditional logit framework to model the issuer's bank choice. The issuer's choice set contains $J = 30$ (unordered) alternative banks, representing the top 30 banks ranked by proceeds raised in offerings completed during the decade in which the issuer's transaction takes

place.

The issuer's bank choice follows an additive random utility model which specifies utility for transaction i as:

$$u_i = X_i\beta + (z_iA)' + \xi_i,$$

where β is a $p \times 1$ vector of alternative (bank)-specific regression coefficients, A is a $q \times J$ matrix of case (transaction)-specific coefficients, and the elements of the $J \times 1$ error vector ξ_i are independent Type I extreme-value random variables. Each transaction i yields a set of observations $X^*_{ij} = (X_i, z_i)$, where X_i is a matrix of bank-specific attribute vectors for each of the J banks in the choice set and z_i is a 1 *x* q vector of transaction-specific (bank invariant) attributes. Defining $\beta^* = (\beta, A)$ and $y_{ij} = 1$ if the *ith* issuer selects bank j with attribute vector X^*_{ij} (and 0 otherwise), the model's choice probabilities satisfy

$$\Pr(y_i = 1 \,|X_i, z_i\,) = \frac{\exp\left(X^*_{ij}\beta^*\right)}{\exp\left(\sum_{j=1}^{J}(X^*_{ij}\beta^*\right)}.$$

Assuming independent and identically distributed errors in the conditional logit framework yields the independence of irrelevant alternatives (IIA) property that the odds ratio for a given pair of alternatives is independent of the characteristics of other alternatives. In practice, the assumption may be violated when members of the choice set are close substitutes for one another as quite plausibly could be the case among at least some of the banks in our choice sets. In fact, tests for violations of the IIA assumption (see Hausman and McFadden 1984) reveal this to be the case. A nested logit specification addresses this problem by permitting error correlation within groups while treating errors across groups as independent. Note that the nested logit specification reduces to the conditional logit model under the assumption of independent and identically distributed errors.[27]

There is no obviously "correct" nesting structure in our setting. Banks can differ from one another along a number of dimensions including their institutional and retail investor networks, capitalization, and industry- and product-specific expertise. Ideally, a bank group would comprise close substitutes with one another that are distinct from banks in other groups. The results reported in the next section are based on groups defined by the top 5 banks ranked by proceeds, the next 15 banks and the final 10. These groupings roughly correspond with the industry characterization proposed by Hayes (1979)

[27] In contrast to the expression for the conditional logit choice probabilities given above, the nested logit choice probabilities are equal to the product of the probability of selecting a group and the probability of selecting a bank conditional on having selected the bank's group. See Cameron and Trivedi (2008, ch.15) for further details. We examine the sensitivity of our results to the violation of the IIA assumption by also estimating a simple conditional logit model that includes only the bank-specific attributes and a version that includes both the bank-specific and transaction-specific attributes. Each specification yields results that are qualitatively similar to those obtained under the nested logit specification. See Table A.II in the appendix for details. The number of transactions differs across the logit and nested logit specifications during the last four estimation periods. This reflects the fact that the simple conditional logit model admits the possibility of the issuer selecting multiple banks to co-manage its transaction while Stata's nested logit routine (*NLogit*) does not.

around the midpoint of our sample period: a "special bracket" comprising 5-6 banks, a "major bracket" comprising 14-16 banks, with the remainder making up a "submajor" bracket. Table A.I reveals that the market share accounted for by the top 5 banks ranges from 37% (1960s) to 60% (1980s). The market share for the second group of 15 banks ranges from 29% (1980s) to 40% (1980s). Finally, for the last 10 banks, market share ranged from 2% (2000s) to 6% (1980s). Recognizing that there remains a degree of arbitrariness in our grouping strategy, we have experimented with other groupings. Although we do not report results for alternative groupings, our conclusions are not sensitive to the alternatives with which we have experimented.

Our primary interest is in the influence of the bank-specific attributes X_i, especially *RelStr*, on the issuer's bank choice. In addition to *RelStr*, these attributes include *RelStrSIC*, *EVC* and, for the 8-bank subsample, either *Tenure* or *Experience*. Each attribute varies across banks. *RelStr* and *RelStrSIC* generally vary across transactions in a given year but *EVC*, *Tenure*, and *Experience* do not. *RelStr* does not vary across transactions for issuers with exclusive banking relationships that carry out more than one transaction during the estimation period. The transaction-specific parameters (*Equity*, *Log Deal Value*, and *Deals to Date*) are estimated for the top 5 and next 15 bank groups with the bottom 10 bank group providing the base for comparison.

4. Estimation Results

Tables IV and V present results for each of the 7 estimation periods. In Table IV, we report estimated coefficients (with standard errors in parentheses) for each bank-specific attribute.[28] We report parameter estimates and standard errors for transaction-specific attributes in Table V. The χ^2 test statistics reported in Table IV indicate a very good fit to the data in each estimation period. Consistent with these test statistics, the (unreported) average predicted probabilities for individual banks generally correspond closely with their sample probabilities.[29]

We begin with the full-sample model specification that includes neither *Tenure* nor *Experience*. *RelStr* has a positive and statistically significant effect on the issuer's bank choice during each of the seven estimation periods. The influence of *RelStr* reached its height during the 1960s, following a post-war period of relationship rebuilding, and declined thereafter. But, with the exception of *EVC* during the final estimation period, the effect of *RelStr* on the issuer's bank choice is the largest among bank-specific variables throughout the sample period. If *RelStrSIC* and *EVC* are successful in controlling for the quality and range of services provided by banks, then the post-1960 results suggest that issuers

[28]The signs of conditional logit coefficients can be directly interpreted to indicate the directional effect of a change in the attribute on the choice probability. See Cameron and Trivedi (2008, p, 492).

[29]As noted in section 2.2.1, we have also estimated specifications of the models reported in Table V that include bank market share among the bank-specific attributes. As one would expect given findings in the existing literature, coefficients estimated for this variable were positive and statistically significant during each estimation period. On the other hand, the inclusion of market share yielded minimal additional explanatory power and led to virtually no absolute change in the estimated coefficients and standard errors for the primary variables of interest described in this section. In the interest of clarity and simplicity, we have not reported these results in Table IV.

placed considerable but diminishing weight on bank characteristics, such as trustworthiness or capacity for certification, that benefit from a strong relationship.

The estimated coefficients for *RelStrSIC* indicate that the state of a bank's relationships with other firms within the issuer's 4-digit SIC category had a more modest (but statistically significant) positive influence on the issuer's bank choice throughout the sample period. This is consistent with issuers valuing broad industry experience throughout the sample period in spite of potential conflicts of interest. However, the 50% decline in the coefficient estimated for *RelStrSIC* from the 1970s to the 1980s suggests either a growing concern for conflicts of interest or a relatively discrete devaluation of industry-specific expertise. Having said that, we suggest below that the change was neither statistically nor economically significant.

Coefficient estimates for *EVC* had a negative and statistically significant influence on issuers' bank choices through the 1950s. Several factors may bear on this seemingly counterintuitive result. First, the 1947 antitrust suit certainly cast underwriting syndicates in a negative light, at least temporarily, and it encompassed most of the major investment banks. Second, note that *EVC* only reflects connections at the management level of syndicates. Figure 3 and the surrounding discussion noted that Morgan Stanley, the most prominent bank during this period, generally refused to share leadership positions with other prominent banks while Halsey Stuart, also a top 3 bank, was relatively poorly connected by virtue of its antagonistic stance toward the industry. Each bank depended on syndicates to underwrite and place their deals but their success was not directly correlated with strong connections at the *management level* of their syndicates.

Finally, aside from the prominent advisory role of the lead bank(s), the dependence on underwriting syndicates surely diluted the contribution of any single bank, even if it had unique capacity. Merrill Lynch distinguished itself by the size of its brokerage network, but it remained outside the top ten banks during the 1960s with market share (in our sample) of less than 3% (see Table A.I). Similary, although Merrill, and to a lesser degree, First Boston, stood apart from the crowd, none of the major underwriters were particularly heavily capitalized.[30] Any unique capabilities related to banks' ability to assemble sophisticated institutional investor networks for pricing and distribution would not likely have emerged by the mid-twentieth century simply because retail investors continued to dominate public markets (See the historical background discussion in the Appendix, Section 8.1). Finally, by all appearances, market-making services and analyst coverage received little attention.[31]

In contrast, the effect of *EVC* was positive through the remainder of the sample period and espe-

[30]Among the top underwriters in 1953, Merrill Lynch, with $24 million in capital, and First Boston, with $20 million, led the way by a wide margin. In contrast, Morgan Stanley and Kuhn, Loeb each held less than $6 million in capital. By the end of the decade, Merrill held $54 million in capital, First Boston's remained little changed at $22 million, and even by 1963 the capitalization of Morgan Stanley ($5 million) and Kuhn, Loeb ($7 million) remained well below $10 million. See the annual rankings provided in *Finance* magazine.

[31]Medina (1954 [1975], p. 43) observed in reference to secondary market price stabilization "While the authority to stabilize is generally given, it is only in relatively few cases that the authority has been exercised." Medina makes no reference to analyst coverage in his detailed discussion of the factors bearing on the selection of a bank to lead a deal or to join a syndicate.

cially strong during the 2000s. This pattern gives us some confidence in our interpretation of *EVC* as a proxy for a bank's ability to assemble the capabilities demanded by issuers. By the 2000s, there was increasing interest among issuers for (star) analyst coverage (Corwin and Schultz 2005) and lending facilities (Drucker and Puri 2005). And as concern for conflicts of interest grew, a lead bank's willingness to work with multiple co-managers capable of "whisper[ing] in the issuer's ear" (Corwin and Schultz 2005) or monitoring performance may have been perceived as a valuable commitment device.[32]

The coefficient estimates for each of the transaction-specific variables reported in Table V are broadly consistent with leading banks having relatively less exposure to transactions for which informational friction or risk would be more severe and that these risks were perhaps diminishing through time. The top 5 and middle 15 banks generally were more likely to be selected for larger deals and for deals brought to market by more active issuers. The coefficient values for each variable declined from the 1970s forward for both the top 5 and middle 15 banks. Equity issuers generally were less likely to select a bank from these two groups relative to the bottom 10 banks after controlling for bank-specific and other transaction-specific attributes and the magnitude of this effect diminished through time.[33] If market share proxies for a bank's broad reputation in the market (Megginson and Weiss 1991), then these results are consistent with more-reputable banks being less likely to take on risks associated with equity issues. The signs on the coefficients for the equity indicator reversed during the 1990s. It is perhaps noteworthy that this estimation period included the run-up to the dot-com bubble during which the highest ranking banks actively sought to manage technology startups that previously were the purview of smaller and more specialized regional banks such as Hambrecht & Quist.

Stata's NLogit routine does not provide a formal statistical test for differences in the nested logit coefficients across time periods and we have been unable to devise such a test.[34] However, it is possible to conduct such a test for the alternative-specific conditional logit (*ASCLogit*) specification reported in Table A.I which includes the same bank- and transaction-specific attributes used in the nested logit model. This model specification yields coefficient estimates for *RelStr* that are virtually identical to those obtained with nested logit specification from the 1960s forward. With the exception of the changes from the 1970s to the 1980s and the 1990s to the 2000s, the cross-decade χ^2 tests for

[32]Evidence of co-management serving as stepping stone to lead-management opportunities (Ljungqvist, Marston, and Wilhelm 2009) suggests that co-managers had incentive to serve in this capacity.

[33]Unconditionally, the bottom 10 banks are less likely to be selected to lead any type of deal but their share of equity deals generally is larger than for either debt or preferred deals.

[34]*Stata's suest* ("seemingly unrelated estimation") provides a χ^2 test of differences in individual coefficients across decades for conditional logit specification with both bank- and transaction-specific attributes but cannot be used for the nested logit specification. The problem can be understood by recognizing that the *suest* routine combines parameter estimates and associated covariance matrices into one parameter vector and simultaneous covariance matrix of the sandwich/robust type (see http://www.stata.com/manuals13/rsuest.pdf). But it does not admit the estimated nest-selection probabilities obtained for the *NLogit* specification. It is possible to simultaneously estimate separate coefficients for each decade in a single nested logit and test for differences but this requires imposing an equality constraint on the nest probabilities across decades. This constraint yields different parameter estimates from those reported in Table IV and a poorer model fit as indicated by the log likelihood for the regression.

difference in *ReStr* coefficients for the *ASCLogit* model after the 1950s indicate that the changes are statistically siginificant at the 1% level. Figure 5 presents 95% confidence intervals for the nested logit coefficient estimates. Consistent with the test statistics obtained for *ASCLogit* model, there is little or no overlap between the confidence intervals for 1950s and 1960s, the 1970s and 1980s, and the 1980s and 1990s.

It is worth noting that the declining influence of *RelStr* corresponds in time with a sharp increase in primary equity market activity. For example, Jovanovic and Rousseau (2001) identify 525 new equity *listings* from 1940-1959 followed by 2,008 during the 1960s, and 4,517 during the 1970s. Gompers and Lerner (2003) report a similar number of *IPOs* for 1940-1959 (588) and 1960-1969 (2,151).[35] We check whether this change has any bearing on our findings by reestimating the nested logit model while excluding IPOs from the sample. The results, reported in Table A.III, indicate that neither the magnitudes of the coefficients estimated for *RelStr* nor their time pattern differ meaningfully from the results reported in Table IV.

The next two specifications for each estimation period in Table IV report results from re-estimating the bank choice model for the 8-bank subsample for which we have measures of the annual change in partner experience.[36] The nesting structure separates the banks into two groups: those with stronger retail brokerage orientations (Dean Witter, E.F. Hutton, Merrill Lynch, Smith Barney) and those that were predominantly wholesale institutional operations (Goldman Sachs, Lehman Brothers, Morgan Stanley, Salomon Brothers). The coefficients for *RelStr* and *RelStrSIC* are similar in magnitude to those estimated for the full-sample specification with the exception that the coefficients for *RelStr* for the 1950-1959 estimation period are substantially larger.[37] The coefficients for *EVC* also are similar to those estimated for the full-sample specification with the exception of the 1980-1989 estimation period where issuer sensitivity to syndicate connections is much stronger among the subsample banks.

Keeping in mind that we cannot link individual partners to specific client relationships, *Tenure* and

[35]Identifying IPOs prior to 1970 is challenging. New *listings* do not necessarily correspond with IPOs and there is no source that we are aware of that provides a comprehensive report of IPOs prior to 1970. We identify IPOs in our estimation sample by comparing the first public equity offering after 1933 by any firm in our database to the set of new listings identified by Jovanovic and Rousseau (2001) and, following Gompers and Lerner (2003), by checking issues of *Moody's* for any indication of the issuer having been previously listed. Details of our classification strategy and the transactions identified as IPOs are available upon request. Also note that our criteria for inclusion in the estimation sample screens out a large fraction of transactions identified as IPOs. For example, of the 4,517 new listings during the 1970s in the Jovanovic and Rousseau (2001) sample, only 202 deals identified as IPOs by SDC, or 8% of the 2,602 deals in our estimation sample for the 1970s, meet our criteria for inclusion in the estimation sample. Using screening methods similar to ours, Jay Ritter reports 111 IPOs from 1975-1979. In contrast, using less stringent screens, such as including best efforts and smaller deals, he reports 1,425 IPOs for the first half of the decade. See Table 8 in "IPOs 2013 Underpricing" at http://bear.warrington.ufl.edu/ritter/ipodata.htm (December 7, 2014).

[36]E.F Hutton does not appear in the top 30 banks by market share during the first three estimation periods and so does not enter the analysis until the 1970-1979 estimation period. Similarly, Dean Witter does not enter the analysis for 1943-1949.

[37]We do not expect there to a be a causal relation between *Tenure* or *Experience* and *RelStr*. *RelStr* is intended to proxy for the state of a client relationship at the time of the transaction in question but it does not reflect changes since the client's last transaction. Since relatively few transactions take place in close proximity to the issuer's preceding transaction, much could change in the state of the relationship. Generally, there is little overlap in the measurement of *Tenure* or *Experience* with the issuer's last transaction.

Experience are intended to proxy for damage to a relationship caused by the departure of a key banker. From this perspective we expect *Tenure* to be directly related and *Experience* inversely related to a bank's selection probability. The coefficients estimated for *Tenure* are statistically different from zero in each estimation period and have the predicted positive sign in the 1960-69 and 1970-79 estimation periods. *Experience* carries the predicted negative sign during the 1940s, 1960s, and 1970s and the effect is statistically significant during 1970-79 period. There may be a plausible explanation for the counterintuitive signs during the 1980-89 period related to our implicit assumption that senior bankers' human capital was worth preserving. During the early part of our sample period, relationship banking was not seen as requiring "an enormous amount of financial ingenuity" (Chernow 1990, p. 513). However, by the 1980s, the skills required to keep pace with more complex client demands and rapid financial innovation may have outweighed any remaining benefits from a personal banking relationship and thus caused clients to favor senior bankers making way for replacements.

The economic significance of the results reported in Table IV is best understood by examining choice probability elasticities with respect to each attribute. For example, for each transaction i during an estimation period, the elasticity with respect to *RelStr* for bank j is

$$Elas_i = \frac{\partial \hat{p}_{ij}}{\partial RelStr_{ij}} \times \frac{RelStr_j}{\hat{p}_{ij}},$$

where $\hat{p}_{ij}$ is the predicted probability of the issuer selecting bank j for transaction i and $RelStr_{ij}$ is bank j's relationship strength with the issuer.[38] Figure 6 plots elasticities against their corresponding value of *RelStr* for each estimation period using the full-sample specification. In each panel we pool elasticities from all transactions (and banks) during the estimation period. For example, the sample for the 1943-1949 estimation period included 842 transactions. For each transaction we obtain an elasticity for each of the 30 banks in the choice set. Each of the 30 elasticities for each transaction is then plotted against the bank's measure of *RelStr* for the issuing firm. For a given transaction, most banks in the choice set have no prior relationship with the issuing firm. By definition, the elasticity of their choice probability with respect to *RelStr* is zero, so that the scatterplots are anchored at the origin.

Several patterns emerge across the seven estimation periods. First, the scatterplot of elasticities is concave in every period. From 1943-1969, for both low and high levels of *RelStr* the concentration of data points indicates that choice probabilities are inelastic (< 1.0) with respect to *RelStr* and elastic (> 1.0) for intermediate levels of *RelStr*; issuers were relatively insensitive to a small change in *RelStr* for banks with which they had very weak or very strong relationships. The latter is consistent with the high level of relationship exclusivity observed in the data. A well-established relationship, was not

[38] See Cameron and Trivedi (2008, p. 492). The partial derivative can either be calculated numerically or by making use of the fact that

$$\frac{\partial \hat{p}_{ij}}{\partial RelStr_j} = \hat{p}_{ij} \times (1 - \hat{p}_{ij}) \times \hat{\beta}_{RelStr}.$$

easily contested.

With the exception of the 1960-1969 estimation period, there is an apparent separation among elasticities for a given value of *RelStr* that corresponds closely with the nesting structure in the nested logit. Elasticities for a given level of *RelStr* are lowest among the top 5 banks and greatest among the bottom 10 banks. Thus for a given level of relationship strength, relationships maintained by the more highly ranked banks were less contestable. But by the 1980s, even the top 5 banks generally exhibited elastic choice probabilities for values of *RelStr* greater than 50. Note further that the center of mass for elasticities associated with exclusive relationships shifted up considerably so that by the 1990s, virtually all exclusive relationships exhibited elastic choice probabilities. In general, as the influence of *RelStr* on issuer choices diminished, as exhibited in Table IV, bank-client relationships with intermediate to high levels of *RelStr* were subject to competition regardless of the bank's status. By the 2000s, however, there is little observable difference between the top 5 and next 15 banks as elasticities for both groups hovered at or below 1.0 for moderate to strong relationships.

Choice probabilities generally were highly inelastic with respect to the remaining bank attributes, with two exceptions. During the 2000s, choice probability elasticities with respect to *EVC* were highly elastic. The effect was especially strong among the top 5 banks which also dominated the upper range of values for *EVC*. Finally, the 1940s provided some evidence of choice probability elasticity with respect to *RelStrSIC* among banks outside of the top 5 by market share, especially among those with exclusive client relationships.

5. Discussion: What Caused the Decline of Investment-Banking Relationships?

Our goal in this section is to determine the most plausible explanation for the time patterns in the data reported in the previous section. We begin with an interpretation that follows naturally from the assumption that our measure of the state of a relationship, *RelStr*, reflects the level of commitment to an informal agreement motivated by the bank's inability to contractually commit to placing the client's interests before its own. Repeated dealing, the observable manifestation of a relationship, is the mechanism for providing the bank with an expected rent stream that exceeds the short-term benefit from a violation of client trust. When informational frictions diminish or technologies advance so as to enable more formal agreements or raise the cost of informal agreements, relationships lose some of their economic utility and, hence, should naturally weaken.

Obviously, our interpretation depends on the economic function of the relationship and whether our measure is a meaningful reflection of the state of a relationship. Viewing the investment bank's certification function from the perspective of the lending relationship literature suggests an alternative interpretation of the data because it rests on asymmetric information between issuers and investors and the bank's ability to gain proprietary information through a client relationship. We conclude by considering the explanatory power of this perspective coupled with regulatory interventions that may have reduced asymmetric information or limited the capacity for banks to sustain information

monopolies.

5.1. Technological Forces that Undermine Long-Term Relationships

An investment-banking relationship and the client-specific reputation that it embodies is a tacit asset that stems from interaction between individual bankers and senior officers of the client firm. As such, it cannot be transferred at arms length (by formal contract) across generations of bankers. Investment-banking relationships therefore require an institutional device that allows reputations and relationships to persist beyond the horizon of individual bankers—in other words, that allow for the inter-generational transfer of reputation. Morrison and Wilhelm (2004) demonstrate that partnership firms, like the banks that dominated the first half of our sample period, achieve this intergenerational transfer.

In their model, tacit assets, such as a reputation for competence and fair dealing that underlies client relationships, can only be transferred from senior to junior agents via on-the-job mentoring. But mentoring itself is not verifiable and, hence, is not susceptible to formal contract. In particular, because human capital is mobile, the beneficiaries of mentoring may leave the firm and sell their new skills to the highest bidder. The partnership addresses this problem: it is deliberately opaque, so that employees face an adverse selection problem in the labor market until they make partner, at which stage they are locked in by the need to invest in the partnership. At the same time, mentoring incentives stem from the prospect of selling out to a new generation of partners, who will invest only if they have the skills to maintain fee income in the future. At a relatively small scale of operation, cross-monitoring among partners to prevent free riding in the mentoring function was relatively straightforward – they often sat in close proximity, if not in the same room, with one another.

The small investment-banking partnerships of the early part of our sample period embodied these technological conditions. Figure 7 shows that, with the exception of Merrill Lynch, the members of the eight-bank subsample described earlier remained quite small through the 1950s with the number of partners ranging from 20-45 in 1960.[39] The smallest partnerships maintained few offices and thus provided an environment in which partners could easily monitor one another. The larger banks had networks of retail brokerage offices, some headed by partners, whose operations were relatively transparent but also tangential to the development and preservation of a reputation for trustworthy behavior toward *corporate* clients.

The opacity of these partnerships assured that, prior to admission to the partnership, defectors faced an adverse selection problem in the labor market; admission to the partnership revealed banker quality, but compelled him to acquire an illiquid partnership stake that tied him to the firm. As we noted in Section 2.2.4, bankers routinely served as partners in a single bank for decades. Figure 4

[39]Merrill's much larger partnership (93 partners in 1960) reflects the 1941 merger with Fenner & Beane that nearly doubled the size of the firm's retail brokerage network and the fact that brokerage offices generally were headed by a partner (Perkins 1999, p. 167).

showed that average partner tenure increased through the mid 1950s for the subsample of eight banks for which we collected partnership data and reached its peak at 14.7 years in 1957. Longevity and loyalty among bank partners was the norm and it was not unusual for a banker to be responsible for a specific client relationship for many years. The summary of bankers serving as directors for their client firms presented in Table A.IV provides particularly strong evidence to this point.[40]

The early banking partnerships also were noteworthy for having been very lightly capitalized and narrowly focused. The model developed by Chen, Morrison, and Wilhelm (2015) suggests that these characteristics, coupled with most of the banks in the client choice sets for the early part of our sample being well established, would limit incentives for opportunistic behavior within a bank-client relationship.[41] Specifically, bank(er)s with well-established "type" reputations for their capabilities have less incentive to behave opportunistically toward their clients and thus are more concerned for their "behavioral" reputation for acting in the client's best interest. Modest capitalization limited banks' ability to engage in activities that might conflict with their advisory functions. To the extent that different bankers or operating units might have differing concerns for these two forms of reputation, the narrow focus of the early banking partnerships reduced the potential for opportunistic behavior arising from conflicts of interest.[42] Finally, when technological change does not pose an existential threat, well-established banks have little incentive to develop new capabilities or products that might threaten a strong behavioral reputation. Chen, Morrison, and Wilhelm (2015) argue that this is a reasonable description of the investment-banking environment until the 1960s.

In summary, the conditions identified by Morrison and Wilhelm (2004) and Chen, Morrison, and Wilhelm (2015) as supporting development and preservation of the institutional reputation at the core of investment-banking relationships existed through at least the middle of the twentieth century. Consistent with this interpretation, investment-banking relationships grew stronger through the 1950s (Figure 1) and issuers conditioned their bank choices more heavily on the state of their relationships (Table IV and Figure 5). Judged by the choice probability elasticities with respect to *RelStr* reported in Figure 6, relationships with the top 5 banks in our choice set were virtually uncontestable.

As a vehicle for preserving relationships and reputation concerns, the partnership is, however, subject to one serious flaw: because partners share the benefits but not the costs of mentoring, it is subject to a free-rider problem, which places an upper bound on the partnership and, hence, upon

[40] In fact, the average of 13 years of service as director by individual bankers reported in Table A.IV significantly understates the longevity of many of these relationships because they continued well beyond the 1949 endpoint of data collection for the *U.S. v. Morgan et al.* trial.

[41] Chen, Morrison, and Wilhelm (2015) explicitly model the conflict within banks between "traders," whose profitability derives from a (type) reputation for superior skill in executing arm's-length transactions, and "relationship managers," who are paid for their (behavioral) reputation for placing their clients' interests first. They exhibit a "phased" equilibrium, in which banks exhibit no concern for client trust until they have built a strong enough type reputation, after which they elect optimally to maintain a reputation for client-centric behavior. Among other things, the model predicts that banks that lack a well-established type reputation are more likely to innovate, and to succumb to conflicts of interest.

[42] The model assumes that, especially with advances in computing technology and risk measurement, risk-taking functions were more susceptible to arms-length (formal) contract and therefore *relatively* less dependent on, and thus less concerned for, the bank's behavioral reputation.

its capitalization. Morrison and Wilhelm (2008) show how a technological shock that increases the potential scale efficiencies in investment banking can undermine the bank's commitment to partnership organization. Although there is a cost to realizing scale efficiencies, for large enough efficiency gains, banks choose optimally to adopt the new technology and to jettison the partnership form at the cost of weakening incentives for protecting client relationships.

By the late 1950s, it became economically feasible for investment banks to complement human capital with batch-processing computing technology (Morrison and Wilhelm 2008, pp. 329-30). Alongside, the rise of institutional investing after 1950 (see Appendix Section 7.1 for details), this technological shock increased the efficient scale of banks' brokerage operations and placed increasing pressure on banks with significant brokerage business to better accomodate the demands of this newly important clientele. Simultaneously, growth rates at Merrill Lynch, Dean Witter and E.F. Hutton, banks with large brokerage operations, began to diverge from growth rates of other banks shown in Figure 7.

By the late 1960s, banks that failed to adapt were in the midst of a back-office crisis and approximately 160 NYSE member firms were forced to merge with competitors or dissolve their operations (see Appendix Section 7.1 for details). Among the firms that survived, Merrill Lynch, Goldman Sachs, and Salomon Brothers were noteworthy for having strengthened their investor relationships by investing heavily in block trading and arbitrage services (*New York Times,* July 17, 1971). With other firms claiming that they were forced to decline institutional business for want of capital to fund investments in technology, the NYSE membership decided in 1970 to permit member firms to operate as public corporations.

Morrison and Wilhelm (2008) demonstrate that if such technological shocks yield an efficient scale that exceeds the operating scale at which a banking partnership sustains tacit assets, such as client relationships, the bank may go public even if the benefits of partnership organization remain socially desirable. Consistent with this argument, the first banks to sacrifice reputational incentives for scale by going public included Merrill in 1971 and Dean Witter and E.F. Hutton in 1972; by the end of the decade, they were joined by all of the other major banks with significant retail-brokerage operations (Morrison and Wilhelm 2008, Table I).

Alongside the early investment bank public offerings, the average partner tenure in our eight-bank subsample declined to 7.3 years in 1970 and industry observers began to comment for the first time on banker mobility and client account switching.[43] Client relationships began to change as the "loose linkage" between fees and services began to breakdown as banks began more actively to charge fees for M&A advisory services rather than continuing the tradition of providing them on expectation of future underwriting mandates.[44] It was during this period of upheaval that John Whitehead set out to reinforce Goldman's "core values" with the 14 business principles highlighted by the epigraph to this paper.

These observations are consistent with the sharpest change in the degree to which issuers condi-

[43] See Thackray (1971) and Thackray (1972).

[44] See Eccles and Crane (1988) and Morrison and Wilhelm (2007, Ch. 8)

tioned on the state of their relationships with banks. Moreover, choice probability elasticities for the 1960s reported in Figure 6 might be interpreted as foreshadowing these changes in the sense that they provide the first indication that non-exclusive relationships with the top 5 banks in the issuer's choice set were open to challenge. By the 1970s, choice probabilities were increasingly elastic among their exclusive relationships.

The 1980s witnessed further advances in computing and financial engineering that transformed and codified many elements of wholesale banking. Among the remaining banking partnerships, an important manifestation of this change was a shift in the relative importance of traditional (and more tacit) investment-banking functions and more highly-codified risk-taking functions and, again, a rapid increase in the size of the partnerships. For example, Morgan Stanley's 1986 S-1 filing with the SEC reports investment banking accounting for 25% of total revenues in 1981 and 24% in 1985. In contrast, the contribution to revenues from principal transactions nearly doubled rising from 7% in 1981 to 13% in 1985 while the firm's capitalization more than tripled from $204m to $672m. Consistent with scale economies in risk-taking functions, the partnership "only" roughly doubled in size from 67 to 125 partners. Alongside these changes, even the strongest relationships maintained by the most prominent banks were contestable judged by the choice probability elasticities with respect to *RelStr* reported in Figure 6. With the exception of Goldman and Lazard, by 1987 all of the major wholesale banks had gone public or were acquired by publicly-held firms (Morrison and Wilhelm 2008, Table I).[45]

Complementary advances in computing power and financial engineering also triggered an unprecedented wave of financial innovation (Miller 1986) including the development of over-the-counter derivative markets and structured financing techniques. Functions that previously had been the exclusive preserve of well-established banks with strong behavioral reputations became contestable by new entrants with the skills required to exploit these advances. Human capital in new risk-taking functions was amplified by computing technology to a far greater degree than in the traditional advisory functions. This contributed to increased demand for skilled labor, rising relative wages (Philippon and Reshef 2012), and increasing skewness in compensation. The increasing skewness in compensation may have contributed to "bad" reputation concerns as bankers took actions to signal their ability even when doing so conflicted with their clients' interests (Ely and Välimäki, 2003; Chen, Morrison, and Wilhelm, 2014, 2015).

Chen, Morrison, and Wilhelm (2015) argue that these forces gave rise to an environment in which exceptional capabilities attracted outsized rewards but were continually under threat of obsolescence. Their model predicts that, faced with this threat, even well-established bank(er)s with strong behavioral reputations will act opportunistically toward clients as they are forced to continually rebuild their capabilities and type reputation. This conflict devalues a client-specific behavioral reputation and

[45]In light of Goldman's sustained commitment to the partnership structure, it is worth noting that it was an outlier among its peers during the hostile takeover movement of the 1980s as it actively sought to protect its client relationships by virtually refusing to advise hostile bidders between 1978 and 1989. Senior management justified this position "partly as a matter of business ethics, but primarily as a matter of business judgement" (Ellis 2009, p. 271). See Chen, Morrison, and Wilhelm (2015, p. 1175) for further details.

thereby weakens incentives for maintaining client relationships. The model also suggests that such reputational conflicts will be especially severe in the large full-service banks that began to dominate the landscape as commercial banks gained traction in securities underwriting during the 1990s. In the absence of an impermeable Chinese Wall, the model predicts that advisory bankers may have incentive to deliver their services from boutiques of the sort that began to gain prominence in the 1990s.

By the late 1990s, commercial bank entry to securities underwriting posed a serious challenge to even the strongest investment-banking relationships. For example, Goldman Sachs maintained an exclusive relationship with Ford Motor Company until 2000 when Ford's treasurer threatened to favor commercial banks for underwriting bond offerings unless Goldman also provided Ford with a credit line.[46] Although Goldman refused to do so and continued to win business from Ford, it was an unprecedented challenge to the relationship.

5.2. Regulatory Interventions and the Decline of Relationships

If repeated dealing between issuers and investment banks reflected market demand for certification of issuer quality or simply anticompetitive behavior among banks, it is conceivable that regulatory interventions over the course of our sample period contributed to the decline of relationships. Although investment banks are not generally in a position to monitor their clients as closely as might be feasible in a lending relationship, repeated dealing might enable a bank to acquire proprietary information of the sort that lies at the heart of lending relationships (Boot 2000). If this were the case, then greater transparency might diminish the value of an investment-banking relationship by reducing the issuer's information advantage.

The Securities Act of 1933 and the Securities Exchange Act of 1934, which established mandatory information disclosure as the animating force in U.S. securities regulation, had the single greatest influence on corporate transparency during our sample period but they preceded our first estimation period by nearly a decade. Regulatory change has been incremental throughout our sample period but the force of disclosure regulations has been amplified by advances in information technology, especially with the advent of the internet and electronic filing during the 1990s. Thus the most important changes in disclosure and transparency occurred well before and after the period of greatest change in investment-banking relationships.

During the 1970s, the SEC sought to improve supervision of accounting-principles standard-setting with, among other things, its 1972 endorsement of the creation of the Financial Accounting Standards Board [FASB] (Seligman 1982, p.551-2). Although the SEC complemented this effort by initiating reforms in corporate disclosure, in 1976 the House Commerce Subcommittee on Oversight and Investigations still claimed that "FASB has accomplished virtually nothing toward resolving fundamental accounting problems plaguing the profession" (Seligman 1982, p.556). Perhaps the most important change during the decade occurred in 1979 when the SEC created a safe harbor for firms voluntarily

[46] *Institutional Investor,* August 1, 2001.

to provide forward-looking forecasts (Seligman 1982, p.559).

With these and other more modest changes, it is conceivable that informational friction diminished over the course of the sample period. This would be consistent with our interpretation of the time pattern in the coefficient estimates for the transaction-specific variables. In general, after controlling for bank-specific characteristics, issuers are more likely to select the bottom ten banks in the choice set when issuing equity, carrying out smaller deals, and when they have been less frequent participants in the market. Table V indicates that, in absolute value, these effects diminished over time.

But even if our transaction-specific variables have not successfully controlled for variation in asymmetric information, several facts suggest that this was not the only, and perhaps not the primary, force driving the time pattern that we observe for issuers' sensitivity to the state of their investment-banking relationships. First, although issuing firms are more transparent now than at the beginning of our sample period, one might argue that issuing firms grew more complex on average with the conglomerate merger movement of the 1960s and early 1970s and with rapid advances in information technology and the biological sciences. Coupling greater complexity with the rise of institutional investing around mid-century certainly created potential for the gap between the best- and least-well-informed investors to widen.

Aside from the Justice Department's unsuccessful 1947 civil suit against the industry, the March 1982 implementation of Rule 415, which provided for shelf registration of securities offerings, is the only regulatory intervention that took direct aim at investment-banking relationships. Calomiris and Raff (1995, p. 121) argue that Rule 415 was "designed to produce a decline in the market power of bankers in their relationship with issuers." Bhagat, Marr, and Thompson (1985) suggest that shelf registration had the potential to intensify competition among underwriters by reducing the costs of informal competitive bidding for underwriting mandates.

An initial flurry of activity in the market suggested that it would have the desired effect. From March, 1982 through May, 1983 there were 508 shelf registrations worth a total of $79.3 billion including about 25% of equity offerings appearing in the sample studied by Denis (1991). But from 1986 to 1995, fewer than 2% of equity offerings were registered under Rule 415 (Calomiris and Raff 1995, p. 114). Judging from the market share rankings reported in the appendix Table A.1, it does not appear to have upset the status quo in rankings or in the concentration of activity at the top ranks. But even if Rule 415 had a significant permanent effect on banking relationships, shelf registration cannot explain the large decline in the coefficient estimates for *RelStr* from the 1960s to the 1980s or the decline in the average level of *RelStr* that began around 1970.

There is no question that the competitive landscape changed with the incremental removal of the Glass-Steagall restrictions on securities underwriting by commercial banks. But this did not begin to take effect until well after the largest declines in our measure of relationship strength and the degree to which issuers conditioned the assignment of underwriting mandates on this bank attribute. Specifically, On March 18, 1987 the Federal Reserve Board approved Chase Manhattan's application to underwrite

and deal in commercial paper in a commercial finance subsidiary. Approval of similar applications from Citicorp, J.P. Morgan, and Bankers Trust followed soon thereafter.[47] It was not until January 18, 1989 that commercial banks could gain approval for underwriting corporate debt. The Fed did not grant equity underwriting powers to commercial banks until September 1990.

These new powers came with heavy restrictions. Specifically, Section 20 underwriting subsidiaries were restricted to generating no more than 5% of their revenue by underwriting high risk transactions such as mortgage-backed securities, consumer debt-backed securities, municipal revenue bonds, and commercial paper as well as corporate debt and (later) equity issues.[48] The remainder of the subsidiary's revenue was to come from underwriting federal, state, and municipal government issues. Through the third quarter of 1990, Only J. P. Morgan (11), Citibank (14), Chemical Bank (17), Bankers Trust (19), and First Chicago (20) had sufficiently large government underwriting businesses to rank among the top 20 debt underwriters (*Wall Street Journal*, September 21, 1990).

Nine commercial banks appear in our 30-bank choice set for 1980-1989 (see appendix Table A.1). In our estimation sample, the most active among these banks, Citicorp, managed only 1.5% of the dollar value of underwritten debt and equity transactions in our 1980-1989 sample. To test whether this short period of limited commercial bank participation influenced the estimation results for this period, we reestimated the nested logit model for the years 1980-1986. This specification yielded results that were not meaningfully different from those reported in Table IV for the full 1980-1989 estimation period.

Commercial banks gained considerable traction during the 1990s, as underwriting restrictions were relaxed further and then eliminated by the 1999 Gramm-Leach-Bliley Act. But Citicorp and J.P. Morgan, were the only commercial banks to enter the top 10 in our sample, ranking 7th and 8th with 5.78% and 4.4% of market share by dollar value. As commercial banks gained market power, investment-banking relationships stabilized. Figure 5 indicates that the sensitivity of issuers to the state of their relationships leveled off as evidenced by the considerable overlap in the confidence intervals for the coefficient estimates for *RelStr* during the 1990s and 2000s. The elasticities reported in Figure 6 suggest declining contestability in moderate to strong relationships among all three bank groupings used in the nested logit analysis during the 2000s. Keeping in mind that most of the commercial banks in our 30-bank choice set entered underwriting, at least in part, by acquiring investment banks (Ljungqvist, Marston, and Wilhelm 2006, fig. 1), the apparent stabilization of relationships during the 1990s and 2000s is consistent with any damage to existing relationships resulting from commercial bank entry being offset by the benefits from concurrent lending and underwriting relationships identified by Drucker and Puri (2005).

In summary, there were no major regulatory changes during the 1960s and 1970s when the sensitivity of issuers to the state of their banking relationships showed the first and most pronounced signs of change. Although we believe that regulatory interventions contributed to altering investment-banking

[47] Note that commercial paper transactions do not appear in our dataset.

[48] The gross revenue restriction for high risk transactions was raised to 10% in September of 1989.

relationships at the end of our sample period, our interpretation of investment-banking relationships as a response to conflicts of interest, coupled with the models described in section 5.1, appears to have superior explanatory power with respect to the timing and relative magnitude of changes observed in the data.

6. Conclusion

Investment-banking advisory services are experience goods and the transactions for which they are delivered require clients to share a good deal of strategic information with their banker. Moreover, bank(er)s are conflicted as they stand between issuers and investors and, increasingly, as a consequence of competing interests within modern, full-service investment banks. Because it is difficult to contract over information and verify bank(er) behavior, banks and their clients may benefit from the development of a reputation for trustworthy behavior. We argue that strong client relationships provide the conditions necessary for reputation concerns to flourish.

However, we show that over the last half of the 20th century, issuers grew less concerned for the state of their relationship with a bank in deciding whether to grant it an underwriting mandate. We argue that the timing of the most pronounced changes in bank-client relationships is consistent with structural changes in financial markets that weakened reputation concerns among banks and diminished issuers' perception of the value of an existing bank relationship. Reputation concerns weakened both because their necessity diminished as some dimensions of the business became more susceptible to formal contract and because increasing scale and scope of bank operations raised the cost of maintaining reputation concerns.

Historically, investment bankers spoke of their reputation for placing clients' interests first as their primary asset. The prevalence of longstanding and relatively exclusive client relationships suggests that clients perceived their bank behaving as if this were so. To the extent that this was true, policymakers could lean more heavily on market forces to enforce good behavior. Recent events have caused many market observers to question banks' concerns for their reputation and instances of behavior that conflicts with client interests certainly appear to occur with greater frequency. Our study suggests that the seeds for this change in financial markets were planted and took root decades ago. A deeper understanding of the forces that sustained and undermined reputation concerns among investment banks over the last half century might better inform policy responses to future structural change in financial markets.

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7. Appendix

The appendix includes historical background (Section 7.1) and a timeline (Figure A.1), details of the 1933-1969 data collection process (Section 7.2), the formal definition of eigenvector centrality used to calculate *EVC* (Section 7.3), a discussion of bank representation on boards of directors from 1933-1950 (Section 7.4), a listing of the top 30 banks by market share for each estimation period (Table A.I), results for alternative model specifications (Table A.II), results for estimation of the nest logit model with IPOs excluded from the transaction sample (Table A.III), and a summary of board service by investment bankers 1935-1949 (Table A.IV).

7.1. Historical Background: 1933-1980

Because our study of banking relationships cuts across a wide time span, much of which has been subject to limited statistical analysis, we provide a brief summary of the events that shaped banks' relationships both with their clients and with one another during the early decades of our sample period. Carosso (1970), Medina (1954 [1975]), and Seligman (1982) provide authoritative accounts of events through the first half of the sample period. Morrison and Wilhelm (2007, ch. 7–8) and Morrison and Wilhelm (2008) provide further detail on events during the latter part of the sample period, as well as a discussion of the influence of technological change on the industry.

From 1933 through the early 1950s, investment banks were subject to political and regulatory efforts intended to weaken their ties with clients and with one another. The 1933 Banking Act was signed into law on June 16, 1933 and was followed on June 6, 1934 by the Securities Exchange Act. For our purposes, the Banking Act's separation of deposit collection and lending from securities market activity (to be completed by June 16, 1934) is particularly relevant, because it forced the reorganization of many important banks, thereby potentially upsetting existing banking relationships.

Some prominent banks (e.g., Goldman Sachs, Kuhn Loeb, Lehman) already specialized in securities offerings and were relatively unaffected by the Banking Act. By contrast, in June 1934 J.P. Morgan formally discontinued its investment banking operations, and had effectively left the business when the Banking Act was enacted. It was not until September 16, 1935 that several J.P. Morgan partners (Harold Stanley, Henry S. Morgan, and William Ewing) left the firm to incorporate Morgan Stanley & Co. They were joined by former partners from Drexel & Co. and soon thereafter by two officers from the former securities affiliate of Guaranty Trust. The fact that the founding members of the new firm had considerable experience in the industry (each of the three Morgan men had been a partner for seven years when J.P. Morgan discontinued its investment-banking operations) contributed to the new firm's ability quickly to gain a leading position among underwriters. First Boston and Smith Barney followed similar paths, bringing together senior bankers from several pre-1933 banking organizations (Medina 1954 [1975]).

Two additional regulatory changes that were directly aimed at upsetting the industry's status quo

soon followed. The 1938 Chandler Act implemented a statute-based approach to bankruptcy reorganization that significantly diminished the value of bank relationships as well as banks' advisory role. The Act was followed by a sharp increase in private placements (especially debt), which further diminished the influence of banks in securities issuance (Morrison and Wilhelm, 2008).[49]

Despite repeated attempts to weaken the ties between issuers and bankers, a 1940 SEC Public Utility Division study noted that six leading New York banks managed 62% of bond issues and 57% of bond, preferred stock and common stock issues between January 1934 and June 1939. Morgan Stanley alone managed 81% of high-grade bond issues, including 70% of high-grade utility bond issues. The study alleged that such concentration reflected "an unwritten code whereby once a banker brings out an issue, the banker is deemed to have a recognized right to all future public issues of that company."[50]

The SEC responded in 1941 by enacting Rule U-50, which mandated competitive bidding (instead of the traditional negotiated underwriting) for the underwriting of utility issues. It was followed in 1944 by the Interstate Commerce Commission's requirement that railroad issues by subject to competitive bidding. The new rules had the desired effect in the sense that they enabled less prominent banks, most importantly Halsey Stuart and Merrill Lynch, to gain ground on the leading banks. To the extent that gains were made by breaking the "unwritten code," they weakened bank-client relationships as we measure them.

U.S. v. Henry S. Morgan et al. posed a major challenge to bank syndicate relationships. The 1947 civil suit, filed under Sections 1 and 2 of the Sherman Act, charged 17 investment banks with "entering into combination, conspiracy and agreements to restrain and monopolize the securities business of the United States [. . .]", and it identified the underwriting syndicate as a primary vehicle for the alleged abuse of longstanding banking relationships. The opinion rendered by Judge Harold Medina in October 1953 (and filed on February 4, 1954) dismissed all charges against the defendants and castigated the government for the weakness of its case.[51] With respect to the syndicate system Medina found "[. . .]no concert of action, no agreement and no conspiracy, integrated over-all or (Medina 1954 [1975], p. 119).

The investment syndicate's distribution function in 1940s had changed significantly from the start of the century. Banks' securities distribution operations were quite small in the 1900s, and they were

[49]Carosso (1970, p. 430) argues that "The ability of great corporations to finance themselves and the growth of private placements had diminished significantly the role and influence of investment bankers in the economy." In the extreme, AT&T, for example, sold $150m of $730m of securities issued between 1935 and 1940 without the assistance of investment bankers – i.e., Morgan Stanley (Carosso 1970, p. 405). Also see Calomiris and Raff (1995, p. 124–132) on the rise of private placements.

[50]"The problem of maintaining arm's length bargaining and competitive conditions in the sale and distribution of securities of registered public utility holding companies and their subsidiaries," Report of the Public Utilities Division, SEC, December 18, 1940. The study is quoted by Seligman (1982, p. 218) in a detailed discussion of the political backdrop for the promulgation of the compulsory bidding rules. Also see Carosso (1970, ch. 20).

[51]The case did not go to trial until November 28, 1950 and it concluded on May 19, 1953. In the interim, counsel for the government and defendant banks produced, in the words of Judge Medina, "truckloads of documents[. . .] The precise number of the hundreds of thousands of documents[. . .] will probably never be known." (Medina 1954 [1975], p. 213).

concentrated on the East Coast. As a result, underwriting syndicates routinely remained in place for a year or more, as syndicate members travelled to peddle syndicates to individual investors. (Medina 1954 [1975], pp. 22-23). Distribution improved as retail brokerage networks expanded (e.g., Perkins (1999, p. 219)) and by the late 1940s syndicate contracts usually were written for 15-30 days (Medina 1954 [1975], p. 43).

The 1940s also witnessed the early stages of changes in the investor community that would reshape both syndicate and client relationships. Institutional ownership of U.S. equities outstanding doubled from 7% to 14% between 1945 and 1960 (Federal Reserve Flow of Funds, L. 213). Mutual fund assets grew from $448 million to $3.5 billion between 1940 and 1952, while pension fund assets grew from $3 billion in 1947 to $18 billion in 1955. As their assets grew rapidly during the 1940s, life-insurance companies became dominant investors in the burgeoning market for private placements, to the point of crowding out investment banks by investing in direct placements.[52]

By the 1950s, The NYSE's daily trading volume averaged about 2.2 million shares on open interest of 5.6 billion shares. Average daily trading volume stood at about 3 million shares in 1960; it then nearly quadrupled by 1970, and then quadrupled again by 1980 (Morrison and Wilhelm 2007, pp. 232-233). The evolution of block trading provides a more direct account of the influence of institutional trading. In 1965, the NYSE reported 2,171 block trades accounting for about 3% of reported volume. By 1972 the number of block trades had grown about 15 times to 31,207 trades (18.5% of volume) and then tripled by 1979 (97,509 transactions, 26.5% of volume).

In spite of fixed commission rates (which were abolished in May, 1975), the rapid increase in trading volume proved a life-threatening burden for many investment banks. The physical exchange of stock certificates was necessary to close transactions, and back office capacity was challenged by the paperwork required to manage the flood of new business. Although fixed commissions prevented price competition, early adopters of nascent batch-processing computer technology, such as Merrill Lynch, gained a competitive edge in the back office that ultimately proved to be decisive. By the late 1960s the industry was in the midst of a back-office crisis stemming from the inability of many firms to close transactions in a timely manner. Morrison and Wilhelm (2007, pp. 235-236) observe that "[l]osses associated with 'too much business' led approximately 160 NYSE member firms either to merge with competitors or to dissolve their operations."

Mergers and acquisitions advisory work evolved into a significant fee-for-service business during the 1960s and 1970s. The 1978 Bankruptcy Code reversed the provisions in the 1938 Chandler Act that prevented banks from taking an active role in corporate reorganization. The confluence of fee-for-service advisory operations, the new bankruptcy code, the development of the market for junk bonds, and the leveraged buyout helped to fuel 172 successful hostile takeovers and a total of 35,000 completed mergers in the U.S between 1976 and 1990 (Morrison and Wilhelm 2007, pp. 251-262).

Figure A.1 summarizes the key events of this Section.

[52] See Kemmerer (1952), Carosso (1970, pp. 499-501), and Sobel (1986, p. 64).

7.2. Data Collection for Transactions Between 1933 and 1969

Our database contains a complete transcription of records from the *Issuer Summaries* produced for the *United States v. Henry S. Morgan, et al* antitrust case and from the Investment Dealers' Digest, Corporate Financing, 1950-1960, 1961; Corporate Financing, 1960-1969. Transaction details were scanned using optical character recognition software, and then checked by hand.

For each transaction, the 1933-69 source data includes the name of the issuer,[53] the date of the offering,[54] the exact title of the security issue, bond ratings where reported in the source data, the manager or co-managers for underwritten offerings and the dollar amount raised.[55] For transactions between 1933 and 1949 additional information about the gross spread and issue registration are also included. A descriptive field contains additional information in free text. We used text processing software to extract information about stock type (preferred, common, cumulative preferred), debt offerings (preferred, cumulative, convertible, note, debenture), number of shares, debt yield, and debt maturity from this field.

We need to identify the lead manager for each issue. However, the source data for deals prior to 1950 lists all managers and co-managers in alphabetical order, and does not name the lead manager. In practice, this is a relatively small problem: only $1,378$ of the offerings performed in the 1940s (17 percent of the total) had more than one manager. We identified the lead bank for 20 percent of those transactions by matching them with contemporary tombstones. The remaining transactions appear to have been too small to have published tombstones, and we were unable to identify lead managers for them. We retain them in the database, with syndicate seniority assigned alphabetically. Excluding these transactions from our econometric analysis does not have a significant effect upon our results.

The source data for 1950-1969 records managers and co-managers in decreasing order of seniority. We checked that this was the case by matching a random sample of 400 syndicates to contemporary tombstone advertisements that listed underwriters in decreasing order of seniority.

The combined hand-collected 1933-1969 database comprises 51,278 transactions. We excluded data that were obviously erroneous, or that were ambiguous.[56] We also excluded a subset of issuance data that were duplicated in 1950s and 1960s source documents. This reduced the sample to 49,155 transactions.

[53]The source data frequently included several different names for the same entity. This occurred for both bank and issuer names. For example, Lehman Bros., Lehman Brothers, and Lehman all refer to the same firm. We identified cases like these with a similarity algorithm that determined the minimum number of character changes required to turn one text field into another (the "Levenshtein distance"). This enabled us to identify groups of names referring to the same firm (bank or issuer), and, hence, to map each such name to a common identifier.

[54]The transaction dates for some deals do not include a day; these transactions are assumed to occur on the first day of the month.

[55]For 1933-1949, the data source also includes the number of underwriters including the manager. The dataset contains dollar amount raised for the 1930s, 40s, and 60s. The data source gave this information only sporadically in the 1950s. Where possible, we supplemented this information with data from the CRSP database, as discussed below.

[56]Generally, this occurred when commas were misplaced: for example, we excluded data that included numbers recorded as 1,00,000.

The 1933-1969 source data does not include SIC codes. We extracted SIC codes, as well as closing prices and trading volumes, for issuers of sufficient size to appear in the CRSP database. The SIC codes were then matched to Cusips for use in extracting financial statements from the Compustat North American database. Since company SIC codes can change over time, we match company names to SIC codes by decade.

Company names not matched in CRSP were manually checked; those that were easily identified as banking, insurance, re-insurance, real estate, and securities industry players were assigned SIC code 6000. Similarly, all public and government bodies were assigned SIC code 9000. We used text-processing programs to identify companies in the natural resources and agricultural sectors, to which we assigned SIC code 1000, railroad companies, which were assigned SIC code 4011, and utilities and transport companies excluding railroads, which were assigned SIC code 4911.[57] Using these methods, we were able to identify SIC codes for 25,088 out of 49,155 transactions between 1933 and 1969.

7.3. Eigenvector Centrality

Eigenvector centrality measures the quality as well as the volume of a bank's relationships. It is defined recursively: a bank's eigenvector centrality is the sum of its ties to other banks, weighted by their respective centralities. For a bank i, write $M(i)$ for the set of banks connected to bank i via co-membership of a syndicate, and let λ be a proportionality factor. We define the eigenvector centrality e_i of bank i as follows:

$$e_i = \frac{1}{\lambda} \sum_{j \in M(i)} e_j. \tag{1}$$

We can rewrite equation (1) as follows. Write A for the symmetric matrix whose (i, j)th element A_{ij} is 1 if bank i and j have a relationship, and zero otherwise; A is often referred to as an *undirected adjacency matrix*. Then

$$e_i = \frac{1}{\lambda} \sum_{j=1}^{N} A_{ij} e_j, \tag{2}$$

where N is the total number of banks in the network. Write

$$\mathbf{e} = [e_1, e_2, \ldots, e_N]'$$

for the $N \times 1$ vector of bank centrality scores. Then equation (2) can be written as follows:

$$\lambda \mathbf{e} = A\mathbf{e}.$$

[57] Specifically, we used regular expression matching within Python scripts to identify companies with specific keywords in their names. Natural resource and agriculture companies were matched to the following keywords: mining, mines, mineral, coal, fuels, oil, petroleum, drill, onshore, farm, grower, dairy, ranch, cattle, breed, irrigation, tree, timber, forest, soil, marine. Railroads companies were matched to keywords rail, RR, Rr, railroad. Utilities and transportation companies excluding railroads were matched to the following keywords: power, light, heat, atomic, energy, electric, public service, gas, utility, hydro, hydraulic, water, pipeline, waste, recycle.

That is, any set $e_1, e_2, \ldots, e_N$ of solutions to equation (1) corresponds to an eigenvector of the adjacency matrix A. When we require centrality scores to be non-negative, the Perron-Frobenius theorem implies that λ must be the highest eigenvalue of A, and, hence, that $\mathbf{e}$ must be the corresponding eigenvector.

7.4. Bankers Serving as Directors: 1935-1949

One manifestation of long-run relationships between individual bankers and their client firms was in service on client boards of directors. Table A.IV provides a summary of board service from 1935 through 1949 for the 17 defendant banks in *U.S. v. Henry S. Morgan et al.*[58] Collectively, the 17 banks identified 83 bankers who served as a director for 162 client firms. Clearly, Goldman and Lehman, with 34 and 53 directorships, were exceptional but all of the banks had partners who served as directors for client firms. The significance of this role across banks is best reflected in the average length of service as a director. Of the 17 banks, 10 averaged at least 10 years of service across their directorships. The average length of service across all of the banks was 13 years and 56 (of 162) directorships equaled or, more likely, far exceeded 15 years.[59] As a point of comparison, Guner, Malmendier, and Tate (2008) report investment bankers serving as directors during 16% of the 2,910 firm-years associated with a sample of 282 firms from 1988-2001. Of the 5,378 director-years in their sample, investment bankers accounted for 1.7% and, across all directors in the sample, the average tenure was 9 years.

Focusing on Goldman Sachs, Sidney Weinberg served as a director for 14 client firms for an average of 16 years with 6 directorships having exceeded 20 years by the end of the reporting period. H.S. Bowers and Walter Sachs each averaged over 20 years in their directorships and each served two clients for over 30 years. Lehman's experience was comparable to Goldman's. Obviously, it is possible that such longstanding board membership served anti-competitive purposes. In fact, the claim of "domination and control" of issuers via directorships was an important element of the Justice Department's complaint against the 17 banks in *U.S. v. Henry S. Morgan et al.* However, even in the extreme cases of Goldman and Lehman, there were a number of transactions for which board representation did not lead to an underwriting mandate.[60]

[58]The defendants provided the court with lists of individual bankers, the firms for which they served as directors, and the length of service in that capacity. Most of the banks simply listed service over the 1935-1949 period and, in most instances, identified directorships that began prior to 1935 without providing a date. Goldman Sachs and Lehman Brothers reported the starting dates for directorships that began prior to 1935. Lehman's report also covered service through year-end 1951. We describe these reporting details to emphasize that the figures for the length of service are conservative.

[59]These figures actually obscure the influence exercised by a number of the most prominent bankers. Because they generally identified the starting point for directorships that began before 1930, the records provided by Goldman and Lehman are the most revealing.

[60]In Part IV of his opinion (pp.153-214), Judge Medina characterized the evidence as yielding a result that was "nothing but a hodge-podge of confusion" and concluded "No judge or court could possibly make a finding of domination and control of the financial affairs of issuers, by defendants or anyone else, on the basis of such proofs."

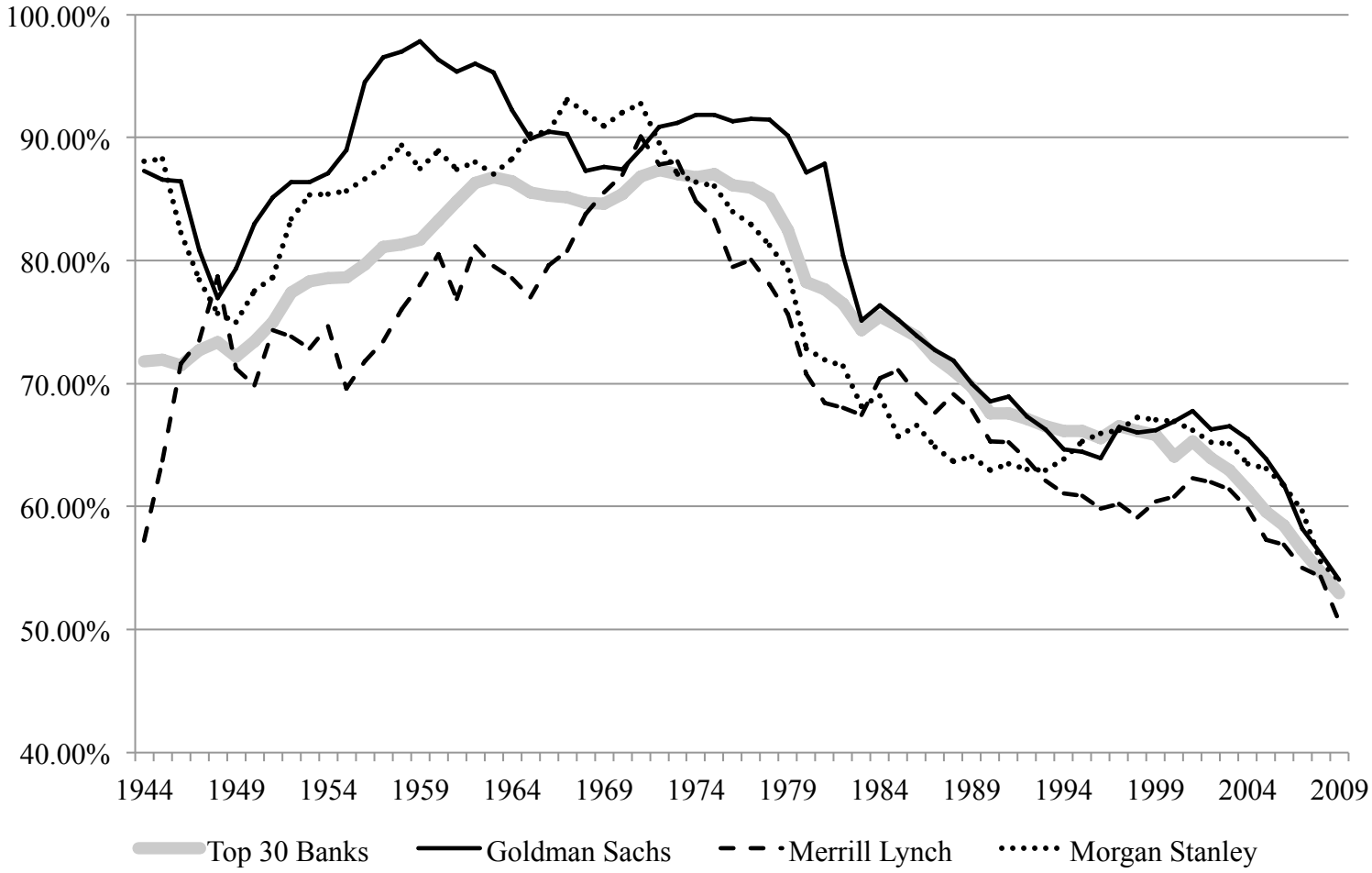

Figure 1. Bank-Firm Relationship Exclusivity. The figure reports an annual measure of a bank's average relationship strength among firms for which the bank managed a deal during the preceding 10 years. Relationship strength is the bank's share of proceeds raised by a firm during the 10-year rolling window. The average relationship strength among the top 30 banks is calculated using the average relationship strength for each of the 30 banks in the issuer's choice set for a given year used in the econometric analysis.

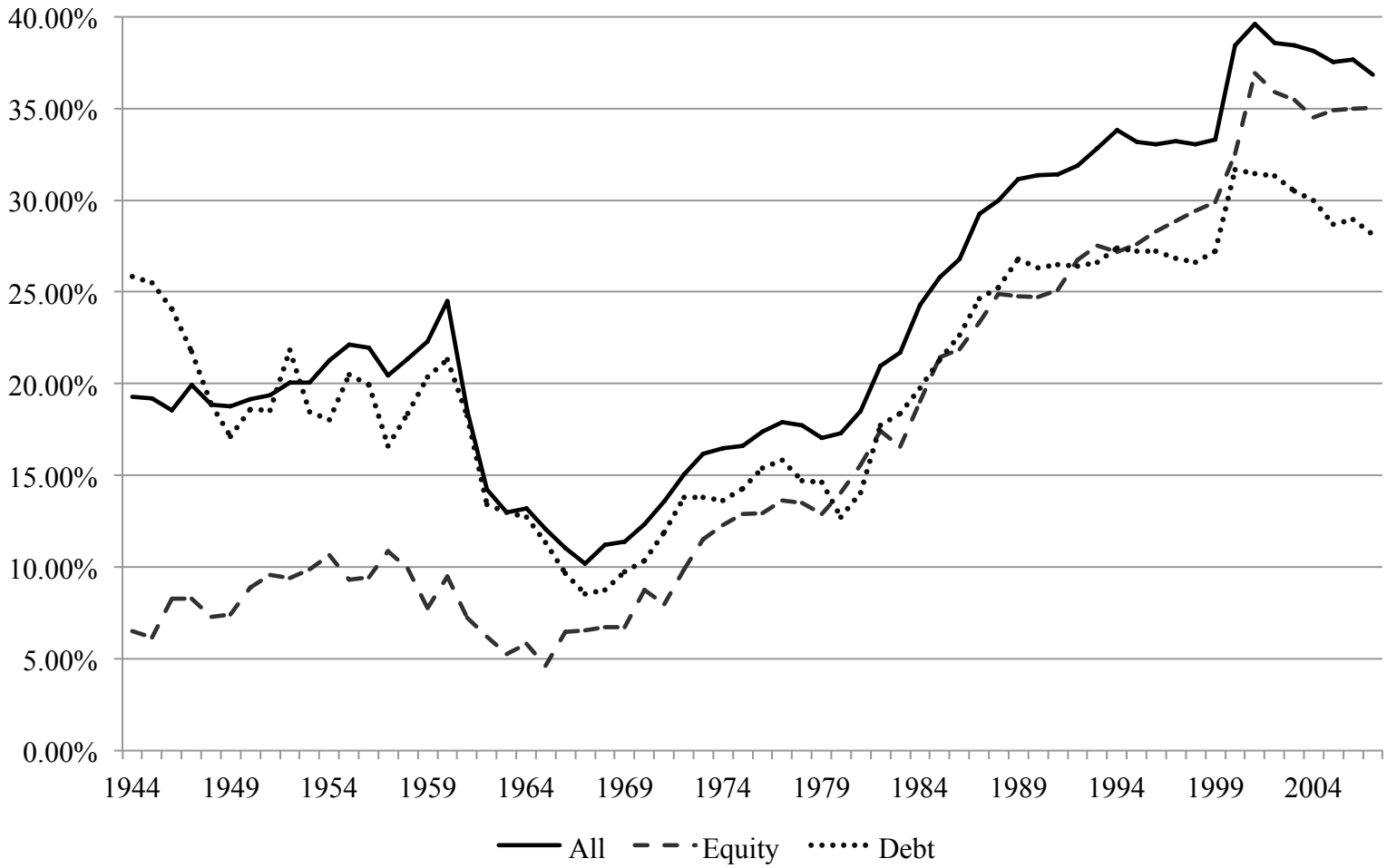

Figure 2. Bank-Firm Relationships within SIC Categories. The figure reports the fraction of banks with multiple clients within a four-digit SIC category, conditional on a bank having at least one client in the industry category. A bank is identified as having a client in an SIC category in a given year if it managed at least one deal for the client during the preceding 10 years. Equity and debt relationships are reported separately. "All" includes preferred stock deals in addition to debt and equity.

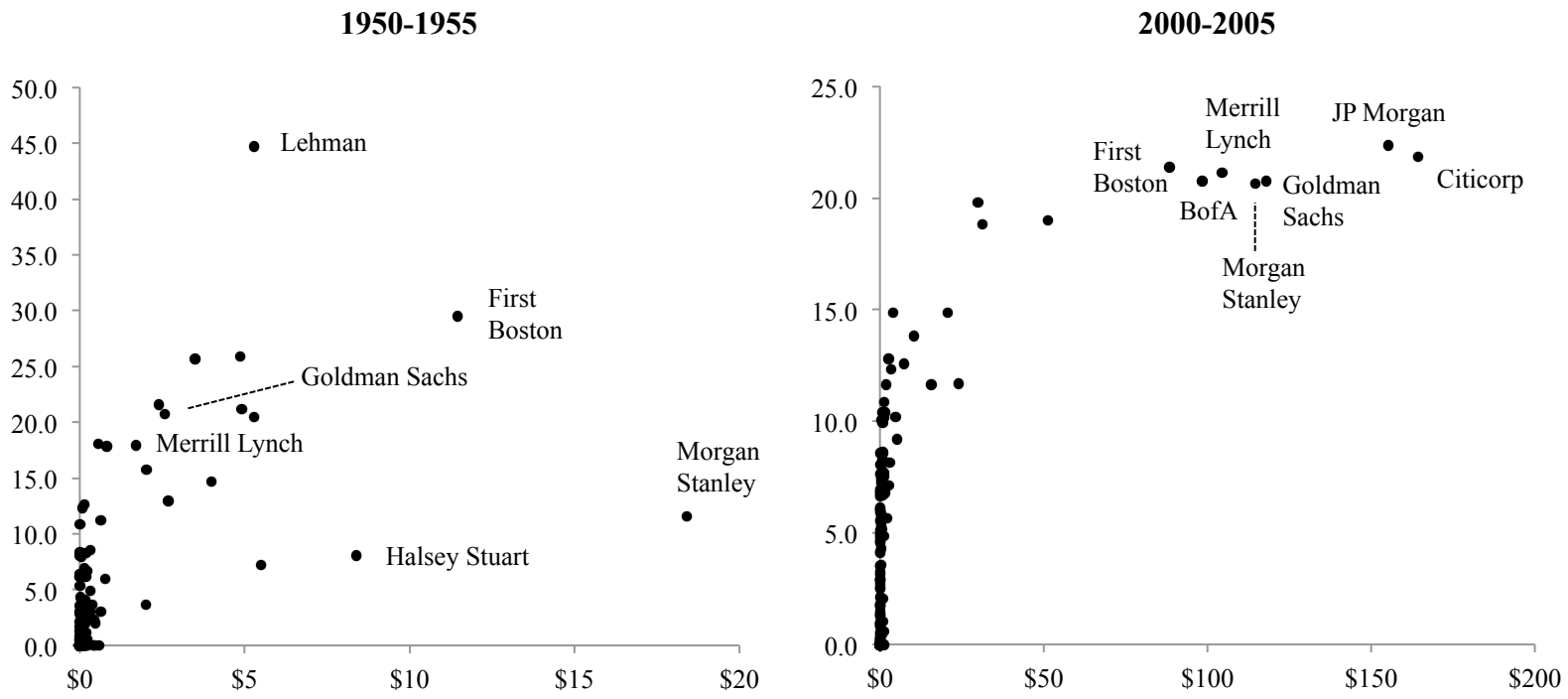

Figure 3. Relationship between EVC and Underwriting Volume. The figure plots banks' eigenvector centrality (EVC) against their underwriting volume for the time periods 1950-1955 and 2000-2005. Underwriting volume is the total proceeds managed by the bank ($m) during the time period. EVC is measured for each bank using syndicate data for every transaction during the 5-year time period and normalized to a 0-100 scale.

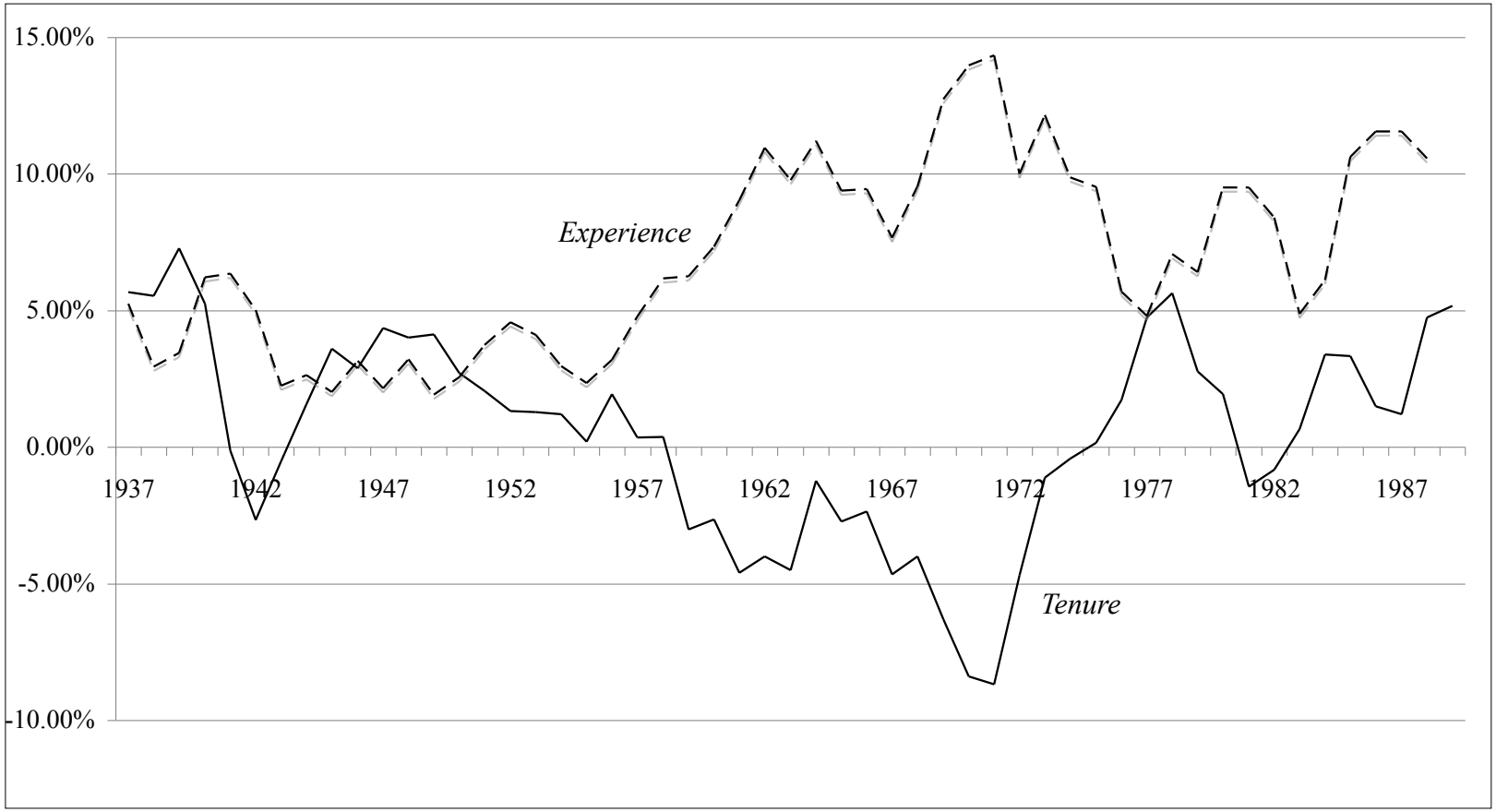

Figure 4. Bank Partner Tenure. The figure reports two measures of change in the annual number years of bank partner experience averaged across a subset of 8 banks (Dean Witter, E.F. Hutton, Merrill Lynch, Smith Barney, Goldman Sachs, Lehman Brothers, Morgan Stanley, and Salomon Brothers). *Experience* is a 3-year moving average of years of partner experience lost to departure as a percentage of the total years of partner experience remaining with the bank. *Tenure* is a 3-year moving average of the percentage change in the total number of years served by partners entering the current year.

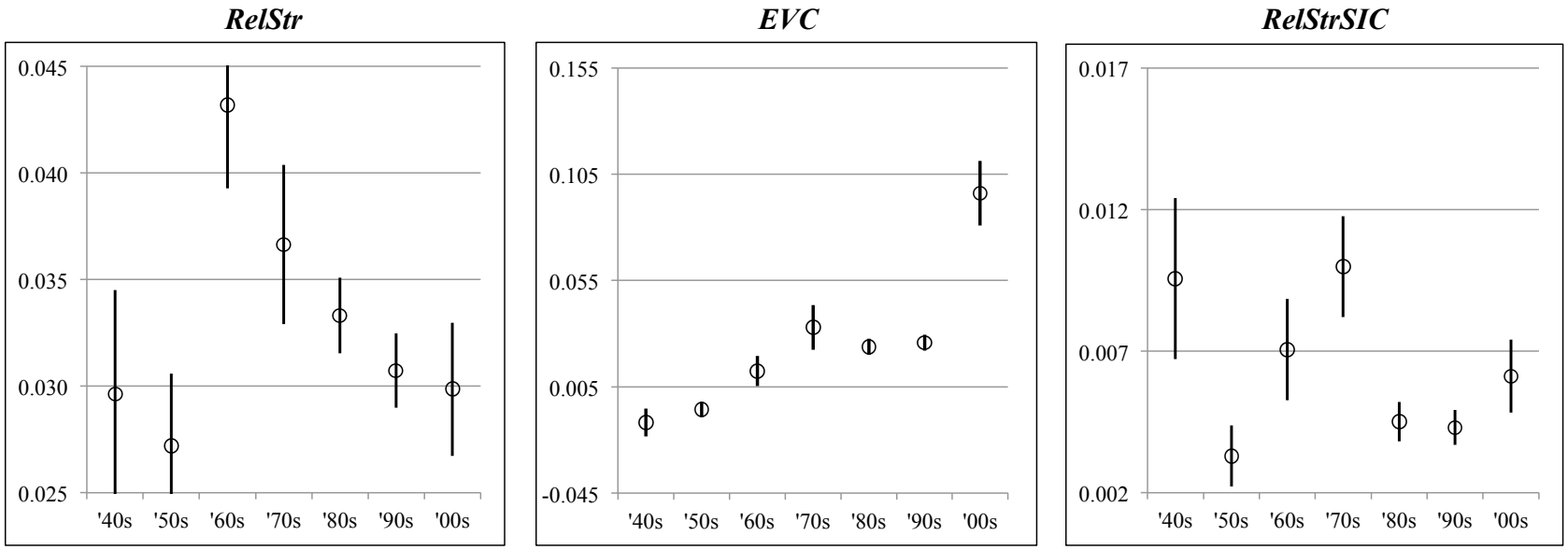

Figure 5. Estimated Coefficients and Confidence Intervals. This figure plots the estimated coefficients and confidence intervals for bank-specific attributes for the full-sample model specification of the bank choice model reported in Table V.

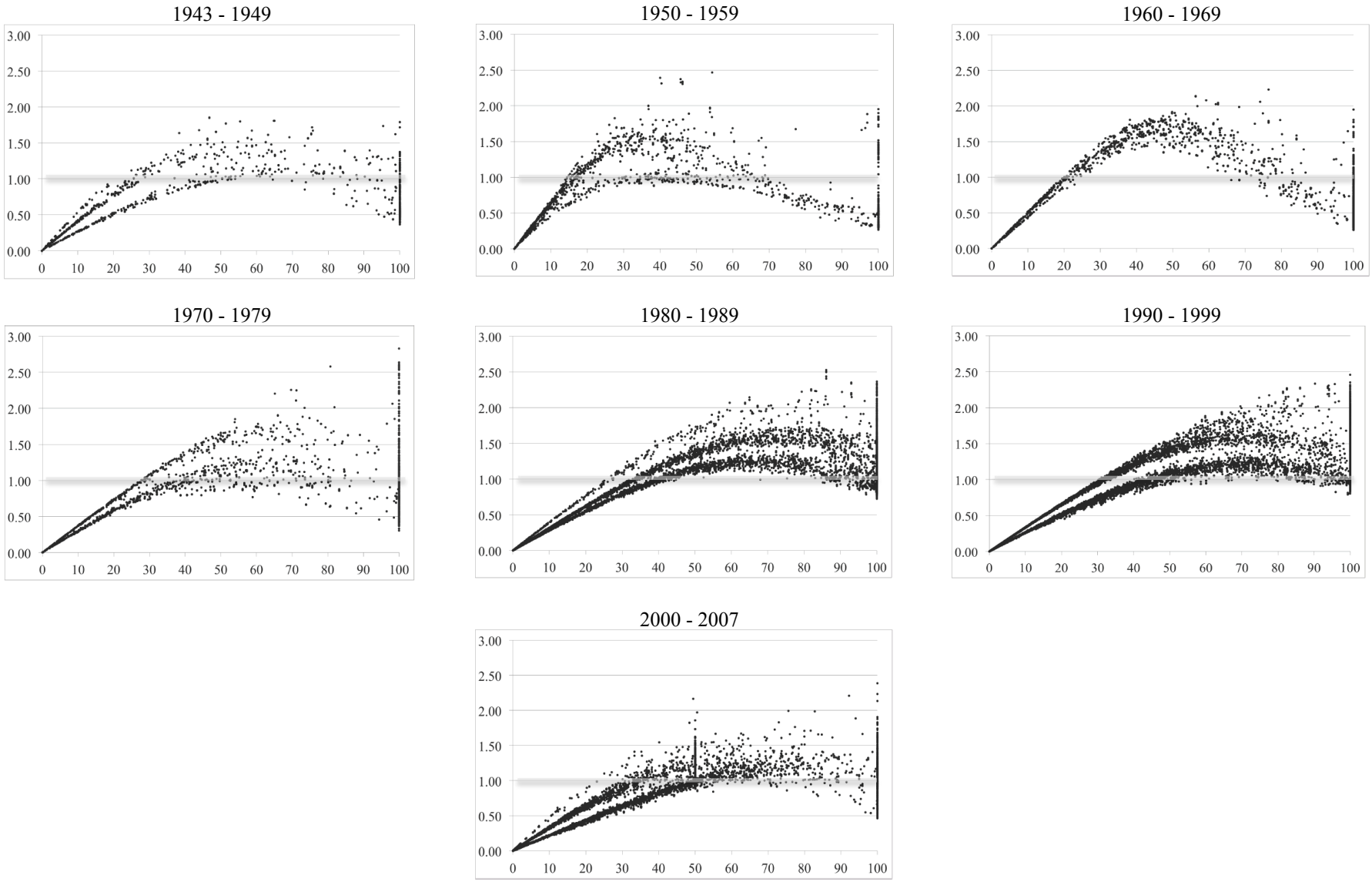

Figure 6. Choice Probability Elasticities With Respect To *RelStr*. During each estimation period we calculate choice probability elasticities with respect to *RelStr* for each bank in the choice set for each transaction. Elasticities are pooled across transactions and banks and then plotted against *RelStr* which ranges in value from 0-100.

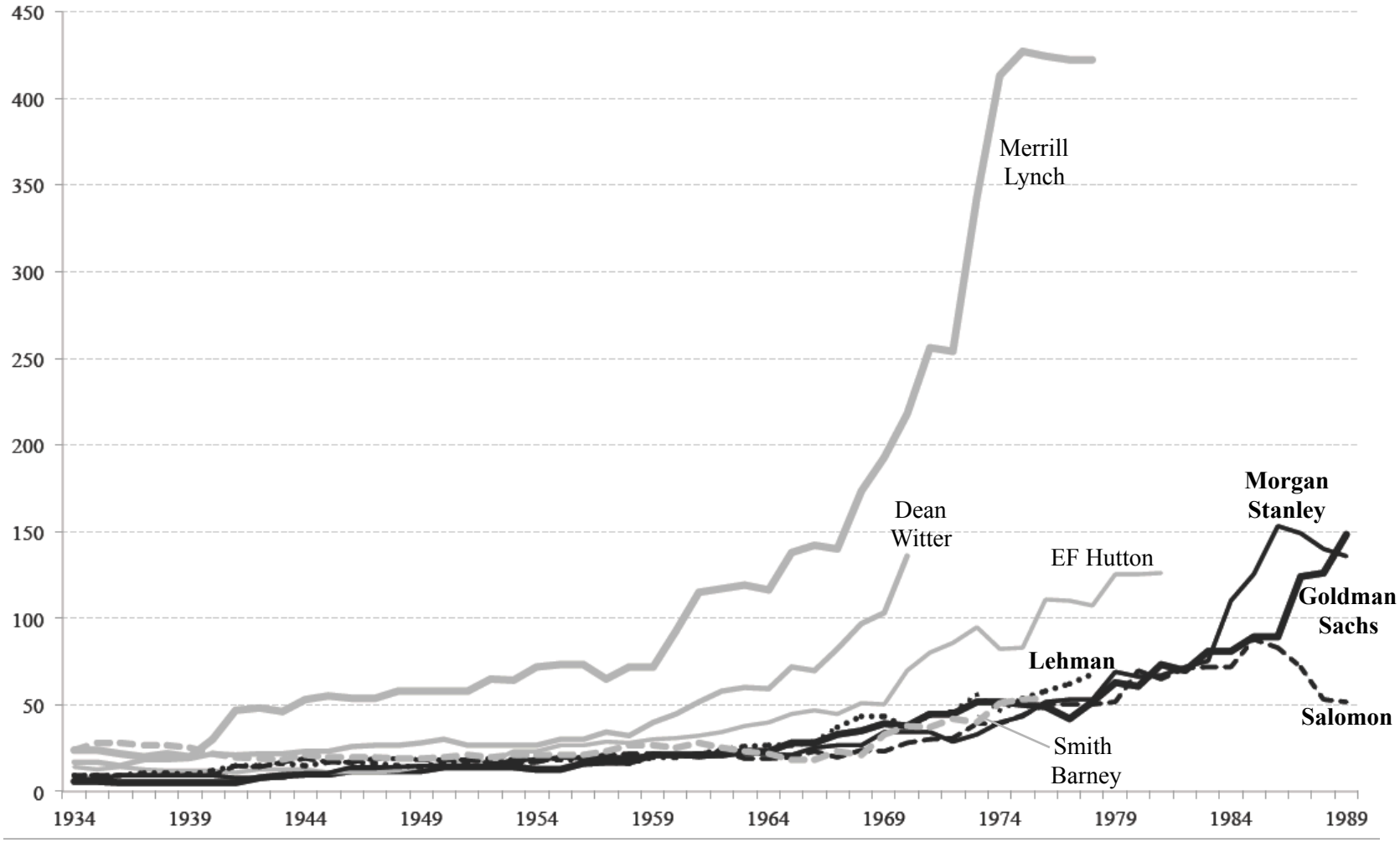

Figure 7. Number of Partners. This figure plots the number of partners on an annual basis for the 8-bank subsample. Goldman Sachs, Lehman, Morgan Stanley, and Salomon comprise the "wholesale" bank group in the nested logit analysis. Dean Witter, EF Hutton, Merrill Lynch, and Smith are assigned to the "retail" bank group. Series' that end before 1989 reflect the point at which the bank changed its reporting convention for the NYSE member firm directories.

Table I

Distribution of Transactions Across Estimation Periods

This table reports the distribution of transactions used in the econometric analysis for each estimation period. We report transactions by type (Equity, Debt, Preferred) and whether or not the issuer had an existing banking relationship. The presence of a relationship is determined by the issuer having completed a transaction during the preceding 10 years for which one of the 30 banks in its choice set served as the bookrunner.

	1943-1949		**1950-1959**		**1960-1969**		**1970-1979**		**1980-1989**		**1990-1999**		**2000-2007**	
	No Prior Relationship	Prior Relationship	No Prior Relationship	Prior Relationship	No Prior Relationship	Prior Relationship	No Prior Relationship	Prior Relationship	No Prior Relationship	Prior Relationship	No Prior Relationship	Prior Relationship	No Prior Relationship	Prior Relationship
All Transactions	842		1,217		2,164		2,602		10,311		12,574		3,867	
	230 (27%)	612 (73%)	259 (21%)	958 (79%)	810 (37%)	1,354 (63%)	1,256 (48%)	1,346 (52%)	4,830 (47%)	5,481 (53%)	4,647 (37%)	7,927 (63%)	1,681 (43%)	2,186 (57%)
Equity	193		172		724		1,061		2,551		4,190		1,658	
	88 (46%)	105 (54%)	56 (33%)	116 (67%)	415 (57%)	309 (43%)	724 (68%)	337 (32%)	1,444 (57%)	1,107 (43%)	2,420 (58%)	1,770 (42%)	854 (52%)	804 (48%)
Debt	516		1,000		1,399		1,494		7,179		7,858		1,865	
	98 (19%)	418 (81%)	193 (22%)	807 (81%)	387 (28%)	1,012 (72%)	524 (35%)	970 (65%)	3,037 (42%)	4,142 (58%)	1,873 (24%)	5,985 (76%)	550 (29%)	1,315 (71%)
Preferred	133		45		41		47		581		526		344	
	44 (33%)	89 (67%)	10 (22%)	35 (78%)	8 (20%)	33 (80%)	8 (17%)	39 (83%)	349 (60%)	232 (40%)	354 (67%)	172 (33%)	277 (81%)	67 (19%)

Table II

Relationship Exclusivity: 1933-1969 and 1970-2007

This table reports the number of client relationships and their degree of exclusivity for the top 30 banks by market share for the sample of 63,302 deals described in section 2. The number of clients is the number of distinct issuers for which a bank managed a deal during the reporting period. Exclusive relationships reflect the percentage of the bank's clients for which the bank managed all of the client's deals during the reporting period. The % of client's deals managed is the average fraction of proceeds raised by a bank's clients for which the bank had management responsibility. Deal credit is apportioned equally to all bookrunners.

	1933-1969				1970-2007		
	Number of Clients	Exclusive Relationships	% of Client Deals Managed		Number of Clients	Exclusive Relationships	% of Client Deals Managed
Morgan Stanley	166	53.61%	69.66%	Goldman Sachs	1,284	31.15%	28.08%
First Boston	262	48.47%	34.60%	Morgan Stanley	1,064	28.95%	27.41%
Kuhn, Loeb	157	55.41%	59.54%	Merrill Lynch	1,264	30.22%	22.05%
Halsey, Stuart	157	18.47%	30.79%	First Boston	1,225	35.35%	22.00%
Lehman Brothers	319	54.86%	47.88%	Citicorp	765	21.44%	17.51%
Dillon Read	117	62.39%	61.49%	J. P. Morgan	783	21.71%	15.18%
Blyth	331	53.78%	36.54%	Lehman Brothers	971	31.00%	17.63%
Goldman Sachs	319	62.38%	55.17%	Salomon Brothers	706	25.50%	15.86%
Salomon Brothers	147	27.21%	24.74%	Drexel	585	46.67%	50.73%
Kidder Peabody	446	69.28%	36.86%	Bank of America	969	35.81%	13.20%
Smith Barney	173	52.60%	33.82%	Bear Stearns	515	37.28%	14.39%
Eastman Dillon	249	69.48%	61.63%	DLJ	513	45.03%	19.93%
Harriman Ripley	103	33.98%	20.14%	Deutsche Bank	523	30.98%	7.72%
Merrill Lynch	176	47.16%	21.76%	Smith Barney	424	36.32%	17.31%
White Weld	226	60.62%	34.43%	Paine Webber	536	45.90%	12.90%
Glore Forgan	124	63.71%	37.97%	UBS	376	23.67%	6.97%
Paine Webber	152	57.24%	50.71%	Kidder Peabody	441	45.12%	10.61%
Lazard Freres	38	31.58%	47.60%	Chase Manhattan Bank	277	36.10%	6.43%
Drexel	75	57.33%	31.53%	Dillon Read	205	45.85%	23.45%
Dean Witter	146	65.07%	38.96%	Barclays Bank	68	17.65%	6.96%
F. Eberstadt	76	63.16%	61.58%	Wachovia	132	13.64%	7.04%
Mellon Securities	19	5.26%	22.79%	Bank One	92	25.00%	7.47%
R. W. Pressprich	64	53.13%	16.38%	Lazard Freres	95	23.16%	15.30%
A. G. Becker	110	63.64%	46.30%	Alex. Brown	392	50.77%	28.60%
Loeb Rhoades	77	67.53%	37.27%	Prudential-Bache Sec.	269	40.89%	8.99%
Hayden Stone	93	73.12%	35.68%	1st Nat'L Bank Chicago	316	36.08%	3.98%
Allen & Co.	81	61.73%	55.81%	NationsBank	194	33.51%	7.82%
Brown Brothers Harriman	31	22.58%	12.56%	Montgomery Securities	251	51.00%	34.97%
Bear Stearns	96	66.67%	19.56%	Dean Witter	221	44.80%	6.15%
Shields & Co.	80	62.50%	25.32%	Blyth	76	27.63%	10.07%
Mean	153.67	52.80%	38.97%	Mean	517.73	33.94%	16.22%

Table III

Summary Statistics for Bank-Specific and Transaction-Specific Variables

This table reports summary statistics for the primary explanatory variables used in the econometric analysis. Mean values are reported by estimation period and for banks selected to manage transactions and for those that were not. *RelStr* is a bank's share of an issuer's transactions (fraction of proceeds) executed in the decade preceding the transaction at hand. For each issuer in a given year, this variable is fixed at the level of a given bank in the choice set (even if the issuer carries out multiple transactions within the year). *RelStrSIC* is the bank's share of proceeds managed for all firms in the issuer's SIC category that executed transactions during the decade preceding the issuer's transaction. For each bank in the choice set, this variable takes a fixed value for all transactions executed by firms in a given 4-digit SIC category in a given year. *EVC* measures a bank's connectedness with other banks during the decade preceding an issuer's transaction. For each bank in the choice set, this variable takes a fixed value in a given year. A bank's rank (1-30) is measured by market share of proceeds during the estimation period and is provided here for comparison purposes. *Log Deal Value* is the log of the dollar value of proceeds raised in the transaction. *Deals to Date* is the number of transactions from the beginning of the sample period (1933) carried out by the issuer prior to the transaction at hand. *Equity* is an indicator for equity deals. Standard deviations are reported in parentheses. *** indicates a statistically significant difference in means for banks selected and not selected at the 1% level.

	1943-1949		1950-1959		1960-1969		1970-1979		1980-1989		1990-1999		2000-2007	
Bank-Specific Variables														
	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected
RelStr	1.14	32.79***	1.15	40.11***	0.68	41.28***	0.76	28.01***	0.95	23.04***	1.36	19.87***	1.12	17.70***
	(1.41)	(40.71)	(1.28)	(40.11)	(1.16)	(44.23)	(1.29)	(41.01)	(1.40)	(38.28)	(1.47)	(33.23)	(1.37)	(31.84)
RelStrSIC	13.61	44.24	18.69	51.46***	10.00	43.77***	13.80	43.50	20.08	43.82***	26.36	45.33	17.77	46.67
	(9.17)	(36.63)	(9.96)	(35.03)	(9.74)	(42.55)	(11.98)	(42.75)	(14.19)	(40.87)	(15.95)	(35.75)	(11.10)	(34.29)
EVC	12.14	12.49	13.34	14.48***	13.99	16.63***	14.31	18.72***	12.26	16.98***	11.68	15.21***	8.95	15.66***
	(0.91)	(10.52)	(0.56)	(9.70)	(0.56)	(8.66)	(0.52)	(5.97)	(0.65)	(7.50)	(0.71)	(6.00)	(1.33)	(3.95)
Bank's Rank within the Issuer's Choice Set	15.71	9.29	15.75	8.29	15.62	12.13***	15.72	9.20	15.72	9.15	15.72	9.22	15.77	7.72
	(8.62)	(7.18)	(8.60)	(6.84)	(8.65)	(8.01)	(8.61)	(7.48)	(8.61)	(7.58)	(8.60)	(7.96)	(8.59)	(6.80)
Transaction-Specific Variables														
Log Deal Value ($m)	69.50		66.70		75.60		138.90		104.60		134.20		140.10	
	(105.00)		(130.00)		(158.00)		(206.00)		(218.00)		(266.00)		(212.00)	
Deals to Date	6.10		11.78		10.02		6.21		5.17		16.11		38.37	
	(8.66)		(14.66)		(17.51)		(15.92)		(10.67)		(33.28)		(101.22)	
Equity	22.90%		14.73%		33.46%		40.78%		24.74%		33.32%		43.00%	
Number of Transactions	842		1,217		2,164		2,602		10,311		12,574		3,867	

Table IV

Bank Choice Model

This table reports coefficients estimated for the nested logit bank choice model for both the full sample and, for estimation periods through 1989, a subset of 8 banks. The issuer's choice is conditional on the following bank-specific attributes: *RelStr* is the bank's share of the issuer's proceeds raised during the preceding decade; *EVC* is the bank's eigenvector centrality measure; *RelStrSIC* is the bank's share of proceeds raised by other firms in the issuer's 4-digit SIC category during the preceding decade. The first five estimation periods also include specifications with one of two additional bank-specific attributes: *Tenure* is the 3-year moving average of the percentage change in the average tenure of a bank's partners during the year of the transaction and *Experience* is the 3-year moving average of partner years of experience lost annually to departure as a percentage of remaining partner years of experience during the year of the transaction. We also estimate (unreported) coefficients for 3 transaction-specific variables. Standard errors are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels. We report a $\chi 2$ test statistic for goodness of fit with (n) degrees of freedom.

Estimation Period	*RelStr*	*EVC*	*RelStrSIC*	*Tenure*	*Experience*	Transactions	$\chi 2$(n)
1943-49	0.0296*** (0.003)	-0.0118*** (0.003)	0.0096*** (0.002)			842	248(9)
	0.032*** (0.008)	-0.008 (0.006)	0.006*** (0.003)	-0.0345* (0.018)		242	39(7)
	0.030*** (0.008)	-0.006 (0.004)	0.004** (0.002)		-0.0007 (0.006)	242	57(7)
1950-59	0.0272*** (0.002)	-0.0057*** (0.003)	0.0033*** (0.001)			1,217	370(9)
	0.055*** (0.009)	-0.020** (0.009)	-0.002 (0.002)	-0.0500*** (0.019)		511	86(7)
	0.052*** (0.009)	-0.010 (0.008)	-0.000 (0.002)		0.0077*** (0.021)	511	85(7)
1960-69	0.0432*** (0.002)	0.0125*** (0.004)	0.0071*** (0.001)			2,164	672(9)
	0.046*** (0.006)	0.025*** (0.006)	0.006*** (0.002)	0.0191** (0.009)		823	107(7)
	0.045*** (0.005)	0.020*** (0.005)	0.006*** (0.001)		-0.0075 (0.006)	823	106(7)
1970-79	0.0366*** (0.002)	0.0330*** (0.005)	0.0100*** (0.001)			2,602	564(9)
	0.032*** (0.003)	0.027*** (0.006)	0.007*** (0.001)	0.0085** (0.004)		1,364	222(7)
	0.032*** (0.002)	0.031*** (0.006)	0.006*** (0.001)		-0.0211*** (0.004)	1,364	228(7)
1980-89	0.0333*** (0.001)	0.0238*** (0.002)	0.0045*** (0.000)			10,311	1,855(9)
	0.027*** (0.002)	0.124*** (0.013)	0.002*** (0.001)	-0.0106*** (0.003)		2,556	395(7)
	0.028*** (0.002)	0.134*** (0.015)	0.002*** (0.001)		0.0068** (0.003)	2,556	390(7)
1990-99	0.0307*** (0.001)	0.0258*** (0.002)	0.0043*** (0.000)			12,574	1,767(9)
2000-07	0.0299*** (0.002)	0.0960*** (0.008)	0.0061*** (0.001)			3,867	747(9)

Table V

Nested Logit: Transaction-Specific Parameter Estimates and Standard Errors

This table reports parameter estimates and standard errors for 3 transaction-specific variables included in the the nested logit specification that includes *RelStr*, *RelStrSIC*, and *EVC* as bank-specific variables. *Equity* is an indicator variable that takes the value 1 for equity transactions and zero otherwise. *Log (Deal Value)* is the log of the dollar value of proceeds raised in the transaction. *Deals to Date* is the number of transactions from the beginning of the sample period (1933) carried out by the issuer prior to the transaction at hand. The nested logit model yields parameter estimates for each variable for the nest containing the top 5 banks by market share and the nest containing the next 15 banks by market share. The parameter estimates are measured relative the third nest containing the last 10 banks by market share. Standard errors are reported below the parameter estimates. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.

Estimation Period	1943-49	1950-59	1960-69	1970-79	1980-89	1990-1999	2000-2007
Top 5 Banks							
Equity	-1.6310***	-0.8080***	-1.0393***	-1.1379***	-0.8479***	0.0977	-0.0406
	0.3099	0.2843	0.17	0.1628	0.0729	0.0667	0.1422
Log (Deal Value)	0.0370**	0.0705***	0.0637***	0.0915***	0.0534***	0.0413***	-0.0179*
	0.0168	0.0119	0.0114	0.0171	0.0051	0.0054	0.0107
Deals to Date	0.0996***	0.0624***	-0.0384***	0.1182***	0.0356***	0.0380***	0.0007
	0.0376	0.018	0.0096	0.0372	0.0071	0.003	0.0007
Banks 6 - 20							
Equity	-0.8869***	-0.9278***	-0.6770***	-0.7755***	-0.7438***	0.2271***	-0.6257***
	0.2704	0.2738	0.1457	0.1568	0.0697	0.064	0.1405
Log (Deal Value)	0.0521***	0.0758***	0.0475***	0.0631***	0.0209***	0.0264***	0.0416***
	0.0156	0.0117	0.0101	0.0167	0.0054	0.0054	0.0093
Deals to Date	0.1015***	0.0652***	0.0153***	0.1078***	0.0422***	0.0316***	-0.0035***
	0.0372	0.0179	0.0056	0.0371	0.0071	0.003	0.0007
Transactions	842	1,217	2,164	2,602	10,311	12,574	3,867

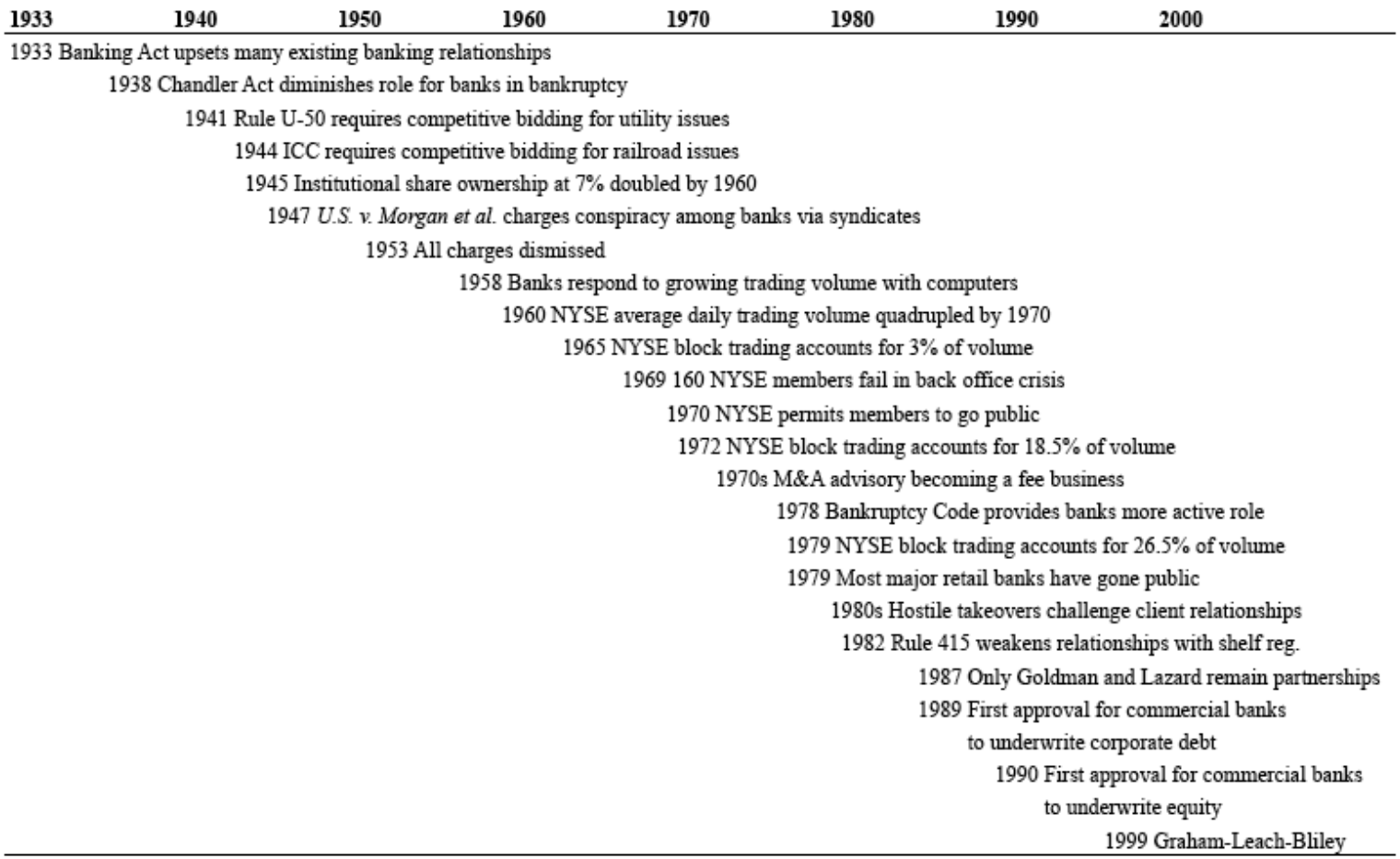

Figure A.1 Historical Timeline

Table A.I

Top 30 Banks by Decade Ranked by Dollar Value of Transactions

This table reports the top 30 banks by market share that appear as members of issuers' choice set for each estimation period. "Nest Share" refers to the market share for the top 5, 6-20, and 21-30 bank groups used in the nested logit analysis.

1940-1949	Market Share	Nest Share	1950-1959	Market Share	Nest Share	1960-1969	Market Share	Nest Share	1970-1979	Market Share	Nest Share
Morgan Stanley & Co.	14.37%		Morgan Stanley & Co.	18.18%		Morgan Stanley & Co.	10.09%		Morgan Stanley & Co.	19.55%	
Halsey, Stuart & Co.	13.17%		First Boston	9.47%		First Boston	8.53%		Goldman, Sachs & Co.	10.38%	
Kuhn, Loeb & Co.	9.57%		Halsey, Stuart & Co.	8.04%		Lehman Bros.	7.69%		Salomon Bros.	9.42%	
First Boston	7.33%		Blyth & Co.	5.69%		Goldman, Sachs & Co.	5.22%		Merrill Lynch	7.58%	
Dillon, Read & Co.	6.14%	50.58%	Lehman Bros.	5.52%	46.90%	Dillon, Read & Co.	5.07%	36.60%	First Boston	7.26%	54.19%
Harriman Ripley & Co.	4.80%		Salomon Bros.	4.80%		Blyth & Co.	5.01%		Lehman Bros.	6.69%	
Blyth & Co.	4.43%		Dillon, Read & Co.	4.75%		Kuhn, Loeb & Co.	4.40%		Smith Barney	4.73%	
Salomon Bros.	3.57%		Harriman Ripley & Co.	4.10%		Kidder, Peabody	4.02%		Blyth & Co.	4.12%	
Lehman Bros.	3.44%		Eastman, Dillon & Co.	3.72%		Salomon Bros.	3.66%		Kuhn, Loeb & Co.	3.89%	
Goldman, Sachs & Co.	2.53%		Goldman, Sachs & Co.	3.56%		Smith Barney	3.24%		Paine Webber	2.89%	
Kidder, Peabody	2.45%		Kuhn, Loeb & Co.	3.32%		Eastman, Dillon & Co.	3.08%		Kidder, Peabody	2.74%	
Mellon Securities	2.44%		Smith Barney	3.20%		White, Weld & Co.	2.81%		White, Weld & Co.	2.46%	
Glore Forgan	2.02%		Kidder, Peabody	2.08%		Halsey, Stuart & Co.	2.68%		Lazard Freres & Co.	2.31%	
Smith Barney	1.37%		Merrill Lynch	1.99%		Merrill Lynch	2.64%		Dillon, Read & Co.	2.05%	
Harris, Hall & Co.	1.13%		Glore Forgan	1.68%		Paine Webber	2.08%		Halsey, Stuart & Co.	1.77%	
Eastman, Dillon & Co.	1.10%		White, Weld & Co.	1.60%		Drexel	1.44%		E. F. Hutton & Co.	1.05%	
Merrill Lynch	0.99%		Paine Webber	1.27%		Lazard Freres & Co.	1.37%		Bache & Co.	0.89%	
White, Weld & Co.	0.99%		Lazard Freres & Co.	0.81%		Glore Forgan	1.36%		Drexel	0.83%	
Union Securities Co.	0.79%		F. Eberstadt & Co.	0.77%		Dean Witter & Co.	1.24%		Dean Witter & Co.	0.79%	
A. G. Becker & Co.	0.76%	32.81%	Allen & Co.	0.68%	38.33%	R. W. Pressprich & Co.	0.96%	39.99%	Eastman, Dillon & Co.	0.70%	37.91%
F. Eberstadt & Co.	0.58%		Shields & Co.	0.48%		Carl M. Loeb, Rhoades	0.88%		A. G. Becker & Co.	0.63%	
Drexel	0.57%		Dean Witter & Co.	0.43%		Harriman Ripley & Co.	0.74%		Carl M. Loeb, Rhoades	0.60%	
Paine Webber	0.50%		Union Securities Co.	0.43%		Bear, Stearns & Co.	0.61%		Stone & Webster	0.34%	
Paul H. Davis & Co.	0.47%		Drexel	0.42%		Hayden, Stone & Co.	0.59%		Bear, Stearns & Co.	0.32%	
Allen & Co.	0.47%		A. G. Becker & Co.	0.40%		F. Eberstadt & Co.	0.57%		Allen & Co.	0.27%	
Lee Higginson & Co.	0.45%		Wertheim & Co.	0.37%		Du Pont	0.56%		Reynolds Securities Inc.	0.27%	
F. S. Moseley & Co.	0.41%		Carl M. Loeb, Rhoades	0.35%		Hornblower & Weeks	0.55%		Hornblower & Weeks	0.27%	
Shields & Co.	0.41%		Hallgarten & Co.	0.33%		Shearson, Hammill & Co.	0.54%		First Mid-America Corp.	0.21%	
Alex. Brown & Sons	0.38%		Reynolds & Co.	0.33%		A. G. Becker & Co.	0.53%		Dominick & Dominick	0.17%	
Otis & Co.	0.35%	4.59%	Hornblower & Weeks	0.33%	3.87%	Allen & Co.	0.48%	6.05%	C. E. Unterberg, Towbin	0.17%	3.25%
Total Value Issued ($bn)	$147			$195			$403			$380	

1980-1989	Market Share	Nest Share	1990-1999	Market Share	Nest Share	2000-2007	Market Share	Nest Share
Drexel	17.79%		Goldman, Sachs & Co.	15.81%		J. P. Morgan & Co.	14.56%	
Goldman, Sachs & Co.	12.72%		Morgan Stanley & Co.	13.29%		Citicorp	13.99%	
First Boston	9.80%		Merrill Lynch	13.17%		Goldman, Sachs & Co.	10.12%	
Salomon Bros.	9.76%		First Boston	8.93%		Morgan Stanley & Co.	9.88%	
Morgan Stanley & Co.	9.49%	59.56%	Lehman Bros.	6.12%	57.32%	Bank of America	9.64%	58.19%
Merrill Lynch	6.41%		Salomon Bros.	6.04%		Merrill Lynch	8.68%	
Lehman Bros.	5.34%		Citicorp	5.78%		First Boston	6.87%	
Paine Webber	2.86%		J. P. Morgan & Co.	4.40%		Lehman Bros.	5.08%	
Kidder, Peabody	2.20%		DLJ	3.78%		Deutsche Bank,A. G.	3.23%	
Dillon, Read & Co.	1.66%		Bear, Stearns & Co.	2.41%		UBS AG	2.75%	
Smith Barney	1.64%		Chase Manhattan Bank	2.01%		Barclays Bank PLC	1.87%	
Citicorp	1.50%		Bank of America	1.38%		Wachovia Corp.	1.76%	
Prudential-Bache	1.14%		Deutsche Bank,A. G.	1.14%		Bear, Stearns & Co.	1.74%	
Bank Of Chicago	1.12%		Smith Barney	1.11%		Bank One	1.52%	
Deutsche Bank,A. G.	1.12%		NationsBank	0.84%		BNP Paribas SA	0.54%	
Bank of America	0.88%		Alex. Brown & Sons	0.75%		ABN AMRO	0.50%	
Bear, Stearns & Co.	0.88%		Paine Webber	0.73%		Fleet Robertson Stephens	0.47%	
Morgan Guaranty Ltd.	0.84%		Montgomery Securities	0.67%		Greenwich Capital	0.47%	
E. F. Hutton & Co.	0.82%		UBS AG	0.62%		SunTrust Banks	0.38%	
Rothschild Unterberg	0.81%	29.22%	Bankers Trust Co.	0.58%	32.24%	HSBC Holdings PLC	0.31%	36.17%
DLJ	0.80%		Dillon, Read & Co.	0.57%		CIBC Ltd	0.29%	
Lazard Freres & Co.	0.79%		Kidder, Peabody	0.52%		SG Cowen Securities	0.24%	
Chemical Bank	0.74%		Hambrecht & Quist	0.46%		Thomas Weisel Partners	0.24%	
Dean Witter & Co.	0.60%		BA Securities Inc	0.39%		SunTrust Rob. Humphrey	0.20%	
Alex. Brown & Sons	0.58%		Robertson Stephens	0.36%		Jefferies & Co Inc	0.18%	
J. P. Morgan & Co.	0.45%		Continental Bank	0.32%		Bank of New York	0.17%	
Allen & Co.	0.41%		Chemical Bank	0.30%		Tokyo-Mitsubishi	0.16%	
Chase Manhattan Bank	0.35%		Prudential-Bache	0.29%		RBC Capital Markets	0.13%	
Shearson/American Exp.	0.31%		Lazard Freres & Co.	0.29%		US Bancorp Piper Jaffray	0.12%	
First Chicago	0.27%	5.30%	Dean Witter & Co.	0.29%	3.79%	Piper Jaffray Inc	0.12%	1.85%
Total Value Issued ($bn)	$1,162			$2,118			$1,582	

Table A.II

Bank Choice Model: Alternative Specifications

This table reports coefficients estimated for 3 specifications of the bank choice model: conditional logit (CLogit), alternative specific conditonal logit (ASCLogit), and Nested Logit (NLogit). The issuer's choice is conditional on 3 bank-specific attributes: *RelStr* is the bank's share of the issuer's proceeds raised during the preceding decade; *EVC* is the bank's eigenvector centrality measure; *RelStrSIC* is the bank's share of proceeds raised by other firms in the issuer's 4-digit SIC category during the preceding decade. The ASCLogit specification estimates (unreported) coeeficients for 3 transaction-specific variables (log dollar value of transaction, issuer's number of transactions from 1933, and an equity issue indicator variable) interacted with 29 individual bank indicators (with the 30th bank serving as the base). The NLogit specification estimates (unreported) coefficients for the 3 transaction-specific variables for the first and second nests (with the third nest serving as the base). Standard errors are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels. For each regression we report the log likelihood (ll) value and a $\chi 2$ test statistic for goodness of fit with (n) degrees of freedom. There is a smaller number of transactions for the NLogit specification during the last four estimation periods because it does not admit cases where the issuer selected more than one bank. In these cases the log likelihood value and $\chi 2$ test statistic are not directly comparable those reported for the CLogit and ASCLogit specifications.

Estimation Period		*RelStr*	*EVC*	*RelStrSIC*	Transactions	$\chi 2$(n)	ll
1943-49	CLogit	0.0385***	-0.0050	0.0139***	842	1,601(3)	-2,063
		(0.001)	(0.003)	(0.001)			
	ASCLogit	0.0337***	-0.0263*	0.0134***	842	2,432(119)	-1,647
		(0.002)	(0.014)	(0.002)			
	NLogit	0.0296***	-0.0118***	0.0096***	842	248(9)	-1,944
		(0.003)	(0.003)	(0.002)			
1950-59	CLogit	0.0496***	0.0015	0.0097***	1,217	3,037(3)	-2,621
		(0.001)	(0.004)	(0.001)			
	ASCLogit	0.0380***	-0.0073	0.0105***	1,217	4,322(119)	-1,978
		(0.001)	(0.013)	(0.001)			
	NLogit	0.0272***	-0.0057***	0.0033***	1217	370(9)	-2,420
		(0.002)	(0.003)	(0.001)			
1960-69	CLogit	0.0492***	0.0216***	0.0082***	2,164	5,557(3)	-4,582
		(0.001)	(0.003)	(0.001)			
	ASCLogit	0.0442***	0.016	0.0061***	2,164	6,704(119)	-4,008
		(0.001)	(0.013)	(0.001)			
	NLogit	0.0432***	0.0125***	0.0071***	2,164	672(9)	-4,503
		(0.002)	(0.004)	(0.001)			
1970-79	CLogit	0.0386***	0.0688***	0.0101***	2,607	4,756(3)	-6,502
		(0.001)	(0.003)	(0.001)			
	ASCLogit	0.0337***	0.0421***	0.0094***	2,607	6,169(119)	-5,796
		(0.001)	(0.015)	(0.001)			
	NLogit	0.0366***	0.0330***	0.0100***	2,602	564(9)	-6,281
		(0.002)	(0.005)	(0.001)			
1980-89	CLogit	0.0337***	0.0460***	-0.0058***	10,373	13,183(3)	-28,857
		(0.000)	(0.002)	(0.002)			
	ASCLogit	0.0328***	0.0179***	0.0031***	10,373	19,065(119)	-25,916
		(0.002)	(0.006)	(0.000)			
	NLogit	0.0333***	0.0238***	0.0045***	10,311	1,855(9)	-27,672
		(0.001)	(0.002)	(0.000)			
1990-99	CLogit	0.0341***	0.0556***	0.0056***	12,941	14,053(3)	-38,098
		(0.000)	(0.002)	(0.000)			
	ASCLogit	0.0298***	0.1197***	0.0029***	12,941	23,486(119)	-33,382
		(0.000)	(0.005)	(0.000)			
	NLogit	0.0307***	0.0258***	0.0043***	12,574	1,767(9)	-34,641
		(0.001)	(0.002)	(0.000)			
2000-07	CLogit	0.0313***	0.1659***	0.0056***	5,664	12,554(3)	-19,417
		(0.001)	(0.004)	(0.000)			
	ASCLogit	0.0296***	0.1312***	0.0030***	5,664	18,091(119)	-16,649
		(0.001)	(0.015)	(0.001)			
	NLogit	0.0299***	0.0960***	0.0061***	3,867	747(9)	-9,889
		(0.002)	(0.008)	(0.001)			

Table A.III

Bank Choice Model with IPO Subsamples

This table reports coefficients estimated for the nested logit bank choice model for the full sample and with IPOs excluded. The issuer's choice is conditional on the following bank-specific attributes: RelStr is the bank's share of the issuer's proceeds raised during the preceding decade; EVC is the bank's eigenvector centrality measure; RelStrSIC is the bank's share of proceeds raised by other firms in the issuer's 4-digit SIC category during the preceding decade. We also estimate (unreported) coefficients for 3 transaction-specific variables. Standard errors are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels. We report a $\chi 2$ test statistic for goodness of fit with (n) degrees of freedom.

Estimation Period	*RelStr*	*EVC*	*RelStrSIC*	*Number of IPOs*	Transactions	$\chi 2$(n)
1943-49						
Full Sample	0.0296***	-0.0118***	0.0096***	15	842	248(9)
	(0.0025)	(0.0033)	(0.0015)			
IPOs Excluded	0.0294***	-0.0128	0.0099***	0	827	246(9)
	(0.0025)	(0.0034)	(0.0015)			
1950-59						
Full Sample	0.0272***	-0.0057***	0.0033***	12	1,217	370(9)
	(0.0017)	(0.0018)	(0.0006)			
IPOs Excluded	0.0272***	-0.0063	0.0033***	0	1,205	370(9)
	(0.0017)	(0.0018)	(0.0006)			
1960-69						
Full Sample	0.0432***	0.0125***	0.0071***	130	2,164	672(9)
	(0.002)	(0.0036)	(0.0009)			
IPOs Excluded	0.0430***	0.0118***	0.0071***	0	2,034	642(9)
	(0.0020)	(0.0038)	(0.0009)			
1970-79						
Full Sample	0.0366***	0.0330***	0.0100***	202	2,602	564(9)
	(0.002)	(0.005)	(0.001)			
IPOs Excluded	0.03631***	0.03697***	0.01012***	0	2,400	520(9)
	(0.0019)	(0.0056)	(0.0009)			
1980-89						
Full Sample	0.0333***	0.0238***	0.0045***	886	10,311	1,855(9)
	(0.001)	(0.002)	(0.000)			
IPOs Excluded	0.0339***	0.01532***	0.004***	0	9,425	1,710(9)
	(0.0009)	(0.0018)	(0.0004)			
1990-99						
Full Sample	0.0307***	0.0258***	0.0043***	2,016	12,574	1,767(9)
	(0.001)	(0.002)	(0.000)			
IPOs Excluded	0.0316***	0.01166***	0.0036***	0	10,558	1,686(9)
	(0.001)	(0.002)	(0.0003)			
2000-07						
Full Sample	0.0299***	0.0960***	0.0061***	543	3,867	747(9)
	(0.002)	(0.008)	(0.001)			
IPOs Excluded	0.0314***	0.0909***	0.0054***	0	3,324	621(9)
	(0.0017)	(0.0007)	(0.0007)			

Table A.IV

Bank Directorships: 1935-1949

This table reports summary information about banker participation on client boards of directors for the 17 defendant banks in *U.S. v. Henry S. Morgan et al.* The data are from trial records stored with the Harold R. Medina Papers housed at the Mudd Library, Princeton University. For each bank, we reoprt the number of individual bankers who served as directors between 1935 and 1949, the number of clients for which each bank provided a director, the total number of years served by banker directors across the clients, the average number of years served by each banker in his directorships, and the number of clients for which a banker served for at least 15 years. We also identify cases in which a directorship was identified as beginning before 1935 (without a specific date) and cases in which the banker rmained as a director at the end of the reporting period (usually year-end 1949).

	Bankers	Directorships	Director Years	Average Years per Director	$\geq$ 15 Years Service	Before 1935	After 1949
Blyth	6	10	68	7	3	4	3
Dillon Read	3	2	33	17	0	2	2
Drexel	2	2	22	11	0	0	2
Eastman Dillon	3	4	30	8	0	0	2
First Boston	2	3	33	11	2	1	2
Glore Forgan	5	6	60	10	2	2	6
Goldman Sachs	9	34	592	17	21	1	25
Harriman Ripley	5	6	58	10	0	1	5
Harris Hall	1	1	4	4	0	0	0
Kuhn Loeb	6	10	146	15	3	8	10
Kidder Peabody	3	4	36	9	0	2	0
Lehman	14	53	788	15	22	0	35
Morgan Stanley	2	2	11	6	0	0	1
Smith Barney	9	8	102	13	0	3	3
Stone & Webster	1	2	17	9	0	2	0
Union Securities	5	9	55	6	0	0	8
White Weld	7	6	70	12	3	5	4
Total	83	162	2,125		56		
Average	5	10	125	13			