

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

Securities transactions are the focal point of relationships between investment banks and their corporate clients. Until the middle of the 20th century these relationships were so stable that the small banking partnerships that dominated the industry generally were willing to provide advisory services on the expectation of being awarded future underwriting mandates.² With the rise of large, full-service banks, client relationships have become less stable, more fee-for-service oriented, and increasingly subject to concern for conflicts of interest and violations of client trust. In this paper we take a first step toward a better understanding of the path taken to this profound change in the structure of capital markets by studying the evolution of investment-banking relationships from 1933 through 2007.

Existing research on investment-banking relationships is limited to the post-1970 period covered by the Securities Data Corporation (SDC) database.³ The first contribution of this research project is the construction of a hand-collected dataset that includes all U.S. public and private underwritten securities transactions over \$1 million from 1933–1969. Tracking the development of investment-banking relationships to 1970 sheds considerable new light on precisely how they have changed from that point forward. In short, investment-banking relationships entered a period of marked decline around 1970 that continued through the 1980s before stabilizing in the 1990s and early 2000s. Many observers have pointed to the demise of the 1933 (Glass-Steagall) Banking Act during the 1990s as the watershed event in capital markets and some question whether banks have any remaining incentive to place their clients' interests first.⁴ If the state of bank-client relation-

¹The 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.

²Eccles and Crane (1988) identify this behavior as a "loose linkage" between fees and service.

³See 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), and Benzoni and Schenone (2010).

⁴In October 2008, 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." See his October 2, 2008 address at the "Markets and the Judiciary Conference" at Georgetown University. In his May 9, 2012 Statement to the Senate Banking Committee Subcommittee on Consumer Protection Paul Volcker commented that

ships is a barometer of banks' behavior toward their clients, then our study suggests that the seeds for increasing conflict between banks and their clients were planted well before the 1990s. If so, attempts to "turn back the clock" by regulation will be futile.

The investment bank's primary intermediary function involves brokering a two-way exchange of information between issuers and investors. Each side of the transaction harbors private information with strategic value. Efficient pricing and distribution of securities offerings depends on the bank's ability to extract information from the counterparties while balancing competing interests in their information. Thus conflict management stands at the core of the investment-banking function. Moreover, as the range of activities carried out by modern investment banks has widened, so has the scope for conflict between the interests of banks and their clients. But neither the bank's ability to balance the competing interests of issuers and investors nor its willingness to subordinate its own interests to those of the client is easily verified. Thus governance of the investment-banking function cannot rest entirely on formal contract; banks must have incentive to maintain a reputation both for skill and trustworthy behavior if they are to effectively serve their clients. As we explain in the next section, an investment-banking relationship may provide an environment in which such reputation concerns can thrive.

The focal point of our analysis is a proxy for the "state" or "strength" of an issuer's existing relationship with a given bank in its choice set. We measure this attribute as the bank's dollar share of the issuer's past securities offerings. We interpret a strong relationship as reflecting, in part, the client's belief that its trust has not been betrayed in the past and an acceptance of sufficient rent extraction by the bank to sustain trustworthy behavior. Alternatively, we can interpret the strength of a relationship as an observable proxy for the state of a bank's *private reputation* with the client.⁵

In our empirical analysis, we adopt a nested logit framework that uses market share rankings (a proxy for a bank's *public reputation*) to group banks as close substitutes for one another. We characterize how issuers condition their bank choice decision on a set of attributes for each bank in their choice set. We interpret an issuer conditioning heavily on the state of its relationship with

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."

⁵We draw a sharper distinction between private and public reputation later in the paper.

a bank as an indication of trust that the bank will once again serve the issuer's best interest or that the issuer values the bank's private reputation going forward. Similarly, less weight given to this attribute suggests declining confidence in trust or in the value of a trust-based relationship. With respect to the latter, in an arms-length setting with greater scope for formal contract, any bank (among close substitutes) will do.

The 1933 Banking Act provides a natural starting point for a long-run analysis of investment-banking relationships because it upset client relationships that rested heavily on commercial banks' ability to underwrite securities offerings and thereby created new opportunities for private (investment) banks.⁶ The Act was followed in close succession by further regulatory intervention aimed at weakening bank relationships, culminating with an unsuccessful 1947 civil suit filed by the U.S. Justice Department (*United States v. Henry S. Morgan et al.*) against 17 investment banks charged with conspiring through their (underwriting) syndicate connections to monopolize the U.S. securities business.

During the early part of our sample period we find that, notwithstanding considerable regulatory upheaval, the influence of bank-client relationships strengthened in the face of regulatory action intended to weaken them. From 1943-1959, choice probabilities for moderate to high levels of relationship strength were largely inelastic for the top 5 banks by market share suggesting that even moderately strong relationships were not easily contested. For the remainder of the top 30 banks, choice probabilities generally were elastic, or more contestable, over the same range. In contrast, the influence of bank-client relationships began to weaken in the 1960s and entered a period of sharp decline that continued through the 1980s. By the 1980s and through the 1990s, the top 5 banks retained the advantage reflected in lower elasticities but virtually all banks' choice probabilities were elastic, even in cases where the banking relationship was exclusive.

Pinning down why investment-banking relationships followed the path that we describe is challenging. Over the course of roughly 75 years much has changed in financial markets. The sample period is bookended by financial crisis and fundamental regulatory change. Important among the early changes were reporting requirements intended to reduce the information asymmetry between

⁶By 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. See Morrison and Wilhelm (2007, p. 210).

issuers and investors. But the rise to dominance of institutional investors may have amplified information asymmetry among investors. The net effect of these changes on the value of a banking relationship is not clear.

Moreover, the sample period witnessed technological changes, including the adoption of computers and advances in financial economic theory, that fundamentally changed bank structure and the execution of intermediary functions. Importantly, the shift from private to public ownership that began in 1970 set the stage for the the large, full-service banks that dominated the last two decades of the sample period. In addition to creating new conflicts between banks and their clients, we show that the change in organizational structure corresponded with unprecedented turnover and mobility among the bankers responsible for maintaining client relationships. We conclude the paper with a discussion of our findings in which we suggest that these technological forces and their consequences, rather than regulatory changes or diminished informational friction, best explain the evolution of investment-banking relationships.

In the following section, we develop the theoretical framework that informs our empirical methodology and our interpretation of the results. Our interpretation of the empirical results also 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. Theoretical Framework

In this section, we outline a theoretical framework that we can use to explain bank-client relationships and the changing importance to clients of their investment-banking relationships. We argue that investment-banking relationships exist to resolve contracting problems in securities markets. These problems arise for two reasons. First, there are severe informational frictions in securities markets. As a result, it is frequently impossible for the counterparties to condition their trade directly on the economic quantities that are most important to them. Second, even when the parties to a deal are able to observe critical economic quantities, it may be technologically impossible for

them to exhibit those quantities in sufficient detail to enable the courts to enforce a formal contract on those terms.

Hence, we argue that informational and contractual problems lie at the heart of any investment-banking relationship. A related literature argues that commercial-bank relationships also exist to resolve informational frictions. For example, Boot (2000) argues that long-term investment in client-specific proprietary information gives relationship lenders a competitive advantage over potential investors, who are less able to evaluate lending opportunities and, hence face a winner's curse problem when they attempt to poach relationship clients. At the same time, precisely because it uncovers important soft information, relationship lending improves resource allocation and so fosters economic efficiency.

Investment-banking relationships share some features of the commercial-banking relationships in the literature reviewed by Boot, but they are not the same. Investment banks are particularly valuable in the new issue market and, in that market, the investment banker's relationship is new and, hence, its value cannot derive from client-specific knowledge gleaned over many interactions. To be sure, once the investment banker has earned a mandate, it is in a position to acquire privileged information about its new client but, *ex ante*, its competitive advantage does not derive from client-specific knowledge. Moreover, much of the most valuable client knowledge is not held by the investment banker. On the one hand, its client inevitably understands its markets and its business processes better than anyone else. On the other hand, and in contrast to commercial banks, investment bankers do not retain investments in the long run, and business-specific information is better translated into demand information by end investors.

In short, investment banks have neither the same sorts of information nor the same long-term exposures as commercial banks. Our thesis in this paper is that, at least historically, investment banks are valuable because they can act as honest brokers. So, for example, investment bankers can facilitate efficient resource allocation by certifying an issuer's prospects (see Booth and Smith 1986, Titman and Trueman 1986, Carter and Manaster 1990).

When investment bankers act as honest brokers, they facilitate the exchange of complex in-

formation that could not conceivably be contracted upon.⁷ Their ability to do so rests upon the strength of their relationships, because the parties to such relationships are induced by continuing relationship rents to play by the rules. Hence, for example, investment bankers are able by selling shares at a discount to fair value to induce investors to generate and to reveal information about the market value of those shares (Benveniste and Spindt 1989, Sherman and Titman 2002). Issuers accept discounted offer prices because, absent information revelation by investors, their issuance proceeds would be lowered even further by the winner's curse (Benveniste and Wilhelm 1990).

Investment bankers therefore use their relationships as the foundation for institutional arrangements that enable the exchange of information over which contracting is impossible. Sitting as they do between issuers, who want to maximize the price at which securities are sold, and investors, who want to pay as little as possible for new securities, *investment bankers are inevitably conflicted.*

If conflicts are a fundamental element of investment banking, then market players should evolve mechanisms for dealing with them. Conflicts are a particularly acute problem for security issuers, who are often less able to assess the market intelligence provided by investment bankers. They can address this in two ways. First, they can build long-term relationships with investment bankers, who then risk the loss of a profitable revenue stream if they are caught abusing their market power. In other words, clients can repeatedly deal with the same banker so as to enable that banker to build a valuable client-specific *private reputation.*

Second, clients could strengthen investment banker relationships by investing in information sharing devices that enable their peers to communicate their experience of a specific banker. Such devices could rest upon information gathering by a regulator or by professional bodies, for example. When this type of information sharing is possible, investment bankers who abuse market position risk the rents that they earn from many relationships. Because its loss is so valuable, such a *public reputation* provides stronger incentives than a private reputation.

We can use this theory to think about the likely effect of technological changes upon investment bank relationships (Morrison and Wilhelm 2008). The central point is that any changes to the legal

⁷It is notoriously hard to contract on information, which cannot be alienated, and which is revealed to potential buyers as soon as they examine it. See ?.

or technological environment that render formal contracting easier should also render investment banking relationships, which support informal commitments, less important. Hence, for example, this theory predicts that the steady adoption of computers, which enabled more information to be recorded and contracted upon, should have weakened investment bank relationships. The simultaneous advances in financial engineering that enabled more business to be transacted contractually in dealing rooms rather than on the basis of legally unenforceable promises should have had the same effect. And, in businesses where relationships were less important, it should have become harder for investment bankers to resolve conflicts of interest.⁸

New technologies allow more data to be recorded, but it need not follow that the data can underpin a formal, legal, commitment. Nevertheless, even when new data cannot be contracted upon, it can be shared. Codifying data therefore opens it up to interpretation by a wide range of market participants, if not by the courts. It can therefore serve as the basis for new forms of public reputation. We have already noted that public reputations provide more powerful incentives than private ones. Hence, we argue that new information technologies should weaken bilateral relationships, even then those technologies cannot enable legalistic commitment,

To summarize, we argue that investment banks enable efficient resource allocation by enabling issuers and investors to make commitments to one another over private information, and over information that is too nuanced and complex to form the basis of a formal contractual relationship. This role inevitably exposes investment banks to conflicts. They manage those conflicts, and render their own commitments credible, by maintaining long-term relationships with their clients and their investors. It is in the best interests of issuers that conflicts are well-managed and, hence, they also work to sustain long-term relationships from which investment bankers can derive rents. It follows immediately that technological, financial, or legal advances that enable more formal commitment should render the investment bank relationships that facilitate informal commitment

⁸For example, banks that combine securities underwriting with brokerage businesses face a trade off between, on the one hand, the immediate income to be derived from brokerage clients in exchange for excessively underpriced issues, and, on the other hand, the combination of lower fees from higher offer prices coupled with the long-term reputational value to be derived from higher prices. As reputation becomes less important, the former effect outweighs the latter. Goldman Sachs' management of eToys' 1999 IPO could be interpreted in this way: see Joe Nocera, "Rigging the IPO Game," *New York Times*, March 9, 2013 for details. See Kang and Lowery (2014) for a theory and evidence related to this conflict and Reuter (2006) for evidence of a positive correlation between institutional holdings of IPOs and commission business directed to their lead underwriters.

correspondingly less important. When clients have better access to formal enforcement devices they should therefore be more willing to deal with a range of investment bankers and, hence, investment bankers should be better able to compete with one another on the basis of price.

3. 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, 1949.⁹ The records were subsequently published in 1951 as *Issuer Summaries*.¹⁰ Data for 1950s and 1960s deals were collected from the *Investment Dealers' Digest*.¹¹ 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.¹² In other words, although there is greater absolute dispersion in transaction

⁹*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.

¹⁰Sullivan & 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 Opinion of Judge Harold R. Medina*.

¹¹Investment Dealers' Digest, Corporate Financing, 1950-1960, 1961; Investment Dealers' Digest, Corporate Financing, 1960-1969.

¹²There 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).

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). We also exclude deals whose industry was recorded as falling into one of these categories.¹³

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.

3.1. 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 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,

¹³Specifically, we 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.”

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.

3.1.1. 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*. 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 the 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.¹⁴ 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. For each bank, we also report the number and fraction of that bank's transactions that were per-

¹⁴The Appendix includes a list of the 30 banks that appear in each decade's choice set and their market share during the decade.

formed with an issuer for which no issue during the previous 10 years was managed by a bank in that issuer's choice set. In the full sample, the percentage of transactions carried out by issuers that had no prior relationship with a bank in its choice set ranged from 73% during the 1943-1949 estimation period to 21% during the 1950-1959 estimation period. Issuers without a prior relationship were most common between 1970 and 1989. As we show later, this was a period of considerable upheaval in bank-client relationships. Generally, equity issuers were less likely than debt issuers to have dealt with a bank in their choice set during the preceding ten years.

The relatively small number of observations for the 1970-1979 period reflects the absence of private placement coverage by SDC during this decade. This could bias our conclusions if underwriters for private placements were systematically selected using different criteria than underwriters for other transactions. There is strong anecdotal evidence that this type of bias would have arisen following the 1938 Chandler Act. The Act implemented a statute-based approach to bankruptcy reorganization, which caused a sharp increase in private placements and so diminished the influence of banks in securities issuance.¹⁵ If private issuance was similarly less dependent upon bank relationships in the 1970s, then the exclusion of private placements from our dataset should bias our results towards a greater issuer dependence upon prior relationships with prospective banks. But any such bias would then lend weight to our conclusion that issuers placed diminishing importance upon prior relationship strength in the 1970s.

3.1.2. *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

¹⁵See Skeel (2001) for a detailed account of the Chandler Act and its influence on the industry.

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. Using a similar strategy, we assign clients and their underwriting histories with sample banks to corporate families when sample firms merge.

3.2. 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 constructing variables to serve as proxies for these attributes, we make several compromises that reflect the long-horizon of our study. Our choices reflect two priorities. First, our variables allow us to represent the issuers decision process across the entire sample period in terms that are consistent with existing research that focuses on the latter part of our sample period. Second, we wish to maintain consistency of model specification throughout the sample period.

In line with these requirements, we use three bank-specific attributes that have been shown to influence issuer bank choices during the latter part of the sample period, and we employ proxies for these attributes that can be measured across the entire sample period. We also exclude a number of bank- and transaction-specific attributes that were not relevant throughout the sample period, or for which consistent measurement was impossible for the entire period.

3.2.1. Bank-Specific Attributes: Relationship Strength

The first bank-specific attribute upon which an issuer could condition its bank choice is the state or strength of its relationship with the bank. Our proxy for this attribute, *RelStr*, measures 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.

Table II provides an overview of client relationships for 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.¹⁶ Table III reveals a shift from the 1933–69 market, in which it was normal for a single bank to underwrite a large fraction, and in many cases all, of an issuer's securities offerings, to the 1970–2000 world, in which underwriting relationships were far less exclusive. During the first half of the sample period, 53% of all client relationships among the top 30 banks were exclusive; that is, in those relationships, one bank *managed every deal* that the issuer brought to market. 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

¹⁶We 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.

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.¹⁷

Figure 1 provides a different perspective on the evolution of investment bank relationships. Every year from 1944 to 2009, we identify issuers whose lead underwriter was Goldman Sachs, Merrill Lynch, or Morgan Stanley, and we plot the average relationship strength (*RelStr*) of those issuers; we also plot the average relationship strength across all of the 30 banks that appear in the choice set facing issuers each year in our econometric analysis. Goldman and Morgan Stanley managed deals accounting for nearly 90% of proceeds raised by their clients throughout the 1960s (and beyond in the case of Goldman). By contrast, during the early part of the sample period Merrill accounted for less than 80% of proceeds raised by firms for which it managed a deal in the preceding 10 years. This is likely a reflection of the fact that Merrill remained primarily a retail-oriented firm with a modest underwriting presence. But over time the firm's retail brokerage network attracted syndicate invitations and, ultimately, lead-management opportunities. By 1970, the average relationship strengths for the three firms were similar, and they declined along similar trajectories for the remainder of the sample period. By 2009, the average relationship strength among clients for all three banks, as well as the average among the top 30 banks by market share from 2000–2009, was slightly above 50%.

The primary focus of our analysis is upon the influence that a client's relationship with a prospective lead bank has upon the client's decision to retain that bank. We argue in Section 2 that issuers value client relationships when formal legalistic devices for resolving bank conflicts are ineffective; when that is the case, banks may be induced to play fair by the prospect of long-term relationship rents. But issuers are also concerned with the quality and range of services that a bank is capable of delivering, for which we should also control. We now define two bank-specific variables intended to capture service-related variables.

¹⁷See Drucker and Puri (2005) for background on the reentry of commercial banks to securities underwriting and the relationship building benefits from lending concurrent with securities underwriting.

3.2.2. *Bank-Specific Attributes: Relationship Strength within Industry Groups*

Issuers account for a bank's industry-specific expertise when deciding whether to award that bank an underwriting mandate. Industry expertise in investment banking is achieved by performing deals in that industry and, hence, we proxy for a bank's expertise in a given industry with a measure of that bank's activity 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 of 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 3.2.1 across each of those firms, and assign that average to *RelStrSIC*.

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%.¹⁸ The pre-1960 peak was not surpassed until 1985.

¹⁸The 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.

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. To the extent that this concern arises across our entire sample period, issuers must trade off industry expertise, as witnessed by a high *RelStrSIC*, against exposure to any conflicts that might arise from retaining a bank that works with their competitors. The coefficients that we estimate for *RelStrSIC* therefore reflect the net impact of these effects upon issuer decisions.

3.2.3. Bank-Specific Attributes: Syndicate Connections

Issuers account for the broad range of services that the investment bank supplies when it serves as underwriter. Those services include pricing and distribution, market making, and analyst coverage. 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 issue.

Underpinning our proxy is the observation that underwriter's services are delivered in collaboration with other banks via underwriting and selling syndicates.¹⁹ The quality of syndicate services that any single bank can deliver is therefore related to 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.²⁰ 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*).²¹ Eigenvector centrality accounts both for the number of relationships that a bank has, and for the quality of those rela-

¹⁹See Corwin and Schultz (2005) for a detailed discussion of the functions carried out by modern underwriting syndicates.

²⁰All 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.

²¹Note 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.

tionships as reflected by a bank's market share.²² 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.²³ 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.²⁴ 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.

²²See 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.

²³As 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).

²⁴See, for example, "Open clash seen in underwriting," Howard W. Calkins, *New York Times*, 7 September 1941.

3.2.4. Bank-Specific Attributes: Banker Stability

We argue in section 2 that an important role of investment banks is in facilitating commitment in situations where formal legal arrangements are not feasible. Issuers should therefore appraise an investment bank's ability to sustain non-contractual trade when deciding whether to award it an underwriting mandate. That ability is founded upon trust formed of long-term interaction. Hence, we use proxies for long standing *personal relationships* to capture a bank's ability to sustain non-contractual trade.²⁵

We cannot identify the individual banks and issuer representatives associated with each client relationship in our sample.²⁶ Direct measurement of personal relationship strength is therefore impossible. However, we can identify the senior bankers most likely to be responsible for relationship management. 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 a subsample of 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).²⁷ We use this data to develop two proxies for the stability of interpersonal relationships.

In any given year, we can 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.²⁸

²⁵Morrison and Wilhelm (2004) argue that tacit assets can be transferred between generations in conditions that correspond to those that obtained in the early investment banking partnerships. But those assets are reputations for competence and fair dealing; the trust upon which such reputations rest is sustained partly by the incentives of the partnership, and also by the long-term relationships upon which we concentrate in this section.

²⁶Although, during the early part of our sample, there are a number of noteworthy instances that we describe later in which we can directly observe the individual bankers responsible for client relationships.

²⁷For 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.

²⁸Goldman 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, cyclical in partner admission and departure is clear in the raw data.

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. Banks subsequently replaced a generation of retiring bankers while also scaling up their operations at a rapid pace.²⁹ We capture loss of experience in a second measure, *Experience*. We calculate *Experience* by, first, computing each year the total number of years lost by departures from the partnership, as a percentage of the total number of years served by remaining partners and, second, calculating 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 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.

²⁹As 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.

3.2.5. *Transaction-Specific Attributes*

We include three transaction-specific variables in our econometric analysis, each of which is intended to control for the nature and magnitude of the information problem presented by the transaction. 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 risk of reputational damage, 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. Given the prohibitive cost of tracking firm age, we include the number of the issuer’s transactions between 1933 and the present transaction as a proxy for these firm attributes. Finally, we conjecture that information about large firms is more widely disseminated and include the log of the dollar value of proceeds raised in the transaction as a proxy for firm size.

3.3. *Summary Statistics*

For estimation purposes, *RelStr*, *RelStrSIC*, and *EVC* have been normalized to a 0-100 scale. Table IV reports summary statistics for these variables by time period and 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 IV also reveals that banks selected to manage deals generally maintained (statistically)

stronger relationships with other firms in the issuer's 4-digit SIC category. This is consistent with issuers valuing industry-specific expertise. However, the absolute difference in this measure between banks that were chosen and those that were not is smaller during the latter part of the sample period. This pattern is broadly consistent with the argument advanced by Asker and Ljungqvist (2010) that clients were concerned about information leakage. That the difference grew smaller over time is in line with our suggestion that, as formal contracting becomes more important, bankers are less concerned to maintain reputations and, hence, that conflicts become more of a concern. Moreover, it suggests that the increasing frequency of banks with multiple relationships within an SIC category documented in Figure 2 rests on a preponderance of relatively weak (non-exclusive) relationships.

On average, banks selected by issuers 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 remain statistically significant. In further contrast, the mean levels for *EVC* for both bank types are relatively stable through time.

We also report the mean rank (by market share for the decade at hand) within the issuer's choice set for the two bank types. On average, issuers selected higher-ranking banks (with lower mean rank values) and this pattern strengthened through time. Finally, the lower panel of Table IV provides summary statistics for two transaction-specific attributes: the dollar value of the transaction and the number of transactions carried out by the issuer since 1933. The latter is intended as a measure of the issuer's activity level in the capital markets. These variables, along with an indicator variable identifying equity issues, will appear in two specifications of the econometric model described in the next section.

4. 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 $1 \times q$ vector of transaction-specific (bank invariant) attributes. Defining $\beta^* = (\beta, A)$ and $y_{ij} = 1$ if the i th issuer selects bank j with attribute vector X_{ij}^* (and 0 otherwise), the model's choice probabilities satisfy³⁰

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

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.³¹

³⁰Note that the conditional logit model admits the possibility of more than one alternative being selected for a given transaction. This occurs in instances where the issuer selects multiple banks to co-manage its transaction. The presence of multiple bookrunners arose only during the last two estimation periods and, even during the 1990s, this was a feature of only 3% of sample transactions. During the final estimation period (2000-2007) 32% of sample transactions had multiple bookrunners.

³¹In 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. The nested logit specification reduces to the conditional logit model under the assumption of independent and identically distributed errors. See Cameron and Trivedi (2008, ch.15) for

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) 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. Returning to Table I, we see for the 1970-2007 period that this nesting structure places about 50% of market share by proceeds with the top 5 banks, about 37% in the second group of 15 banks, and about 4% in the last group of 10 banks. 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 on the issuer’s bank choice. These attributes include *RelStr*, *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 are estimated for the top 5 and next 15 bank groups with the bottom 10 bank group providing the base for comparison. The results are not sensitive to the inclusion of additional transaction-specific attributes that were available for the entire sample period.

further details.

5. Estimation Results

Table V presents estimation results for each of the 7 estimation periods.³² We report estimated coefficients (with standard errors in parentheses) for each bank-specific attribute. The signs of the coefficients for these attributes can be directly interpreted to indicate the effect of a change in the attribute on the probability of a bank being selected by the issuer. For the sake of brevity, we report parameter estimates and standard errors for transaction-specific attributes in the appendix (Table A.III) and simply discuss their implications in the text below. The χ^2 test statistics 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.

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. We can obtain a better appreciation of the magnitude of this effect by exponentiating the coefficients to obtain an estimated odds ratio that reflects the change in the issuer's odds of selecting a given bank in the choice set for a 1 unit (or 1 percentage-point) change in the variable. By this measure, the increase in the odds of selecting a given bank in the choice set for a 1 percentage point increase in *RelStr* range from 2.7% during the 1950s to 4.4% during the 1960s.³³ In summary, if *RelStrSIC* and *EVC* are successful in controlling for the quality and range of services provided by banks, then the post-1960 results

³²In addition to the nested logit specification reported here, we have estimated 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 qualitatively similar results to those reported in Table V. Table A.II in the appendix provides full details. During the last four estimation periods there are transactions for which the issuer selects more than one bank. Stata's nested logit routine (*NLogit*) excludes these transactions from the estimation sample. The number of excluded transactions ranges from 5 during the 1970s to 1,797 (32% of the total) during the 2000s.

³³Table IV shows that among banks selected to manage transactions during the 1960s, *RelStr* had a mean value of 41.28% with standard deviation of 44.23%. This suggests that among selected bank, a 1 standard deviation increase in the strength of the bank's relationship with the issuer would roughly triple ($4.4 \times 44.23 = 195$) the odds of being selected.

suggest that issuers 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. In contrast, the effect of *EVC* was positive through the remainder of the sample period and especially strong during the 2000s as issuers began to express particularly strong interest in the capacity of some banks to deliver star analysts.³⁴ Several factors may bear on the seemingly counterintuitive negative coefficients for the 1940s and 1950s. 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.

³⁴See Corwin and Schultz (2005) for a detailed account of modern underwriting syndicates. They also suggest that the growing importance of co-managers may reflect issuer concerns for conflicts of interest among lead banks. Co-managers might have incentive to monitor lead banks, or "whisper in the issuer's ear," if they perceive a gain from doing so. Ljungqvist, Marston, and Wilhelm (2009) provide evidence that co-management serves as stepping stone to lead-management opportunities.

Merrill Lynch distinguished itself by the size of its brokerage network, but it remained at the fringe of the top ten banks. Similarly, although Merrill, and to a lesser degree, First Boston, stood apart from the crowd, none of the major underwriters were particularly heavily capitalized.³⁵ Any unique capabilities related to banks' ability to assemble sophisticated institutional investor networks for pricing and distribution had not emerged in the mid-twentieth century, because retail investors continued to dominate public markets (See the historical background discussion in the appendix, Section 8.1). And, by all appearances, market-making services and analyst coverage received little attention.³⁶

The coefficient estimates for each of the transaction-specific variables (see Table A.III) are broadly consistent with leading banks having relatively less exposure to transactions for which informational friction could be more severe. The top 5 and middle 15 banks are more likely to be selected for larger deals and for deals brought to market by more active issuers. In contrast, equity issuers generally are 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.³⁷ In contrast, relative to the bottom 10 banks, the top 5 and middle 15 banks are more likely to be selected for larger deals and for deals brought to market by more active issuers. The effect is more negative for the top 5 banks than for the middle 15 and it generally diminished through time. 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 the reputational risks associated with equity issues.

Figure 5 provides a graphical summary of the 95% confidence intervals for the estimated coefficients.³⁸ There is little overlap in the confidence intervals for the *RelStr* coefficients from the

³⁵Among 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.

³⁶Medina (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.

³⁷Unconditionally, 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.

³⁸We have conducted χ^2 tests of differences in individual coefficients across decades for a conditional logit spec-

1960s and 1970s. It is less clear that the change from the 1970s to the 1980s is statistically significant, but the difference between the 1970s and 1990s clearly is significant. Similarly, the results for *RelStrSIC* suggest a significant long-run decline in the influence of the state of a bank's relationships with a client's potential competitors, with the exception of a temporary increase during the 1970s. The results for *EVC* clearly indicate that issuers placed much greater emphasis on this attribute during the 2000s.

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.³⁹ 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.⁴⁰ 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 *Experience* are intended to proxy for damage to a relationship caused by the departure of a

ification with both bank- and transaction-specific attributes using *Stata's suest* ("seemingly unrelated estimation") routine. Inferences drawn from these tests generally correspond with those drawn from examination of confidence intervals for the nested logit specification. *Stata's NLogit* routine does not provide a similar test and we have been unable to devise one that would suit our purpose. 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.

³⁹E.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.

⁴⁰We do not expect there to 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.

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.⁴¹ *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.⁴² 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 are then plotted against the bank's measure of *RelStr* for the issuing firm. For a

⁴¹The difference in scale of the coefficients for *Tenure* and *Experience* reflect the fact that they are measured on a percentage basis as opposed to the 0-100 scale used for the other bank-specific variables.

⁴²See Cameron and Trivedi (2008, p. 492). The partial derivative can either be calculated numerically or by making use of the fact that

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

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 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 roughly 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.

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

Our primary goal is to explain the timing and magnitude of the changes in issuers' concern for investment-banking relationships documented in the preceding section. The central results can be summarized as follows:

- The coefficient estimates for *RelStr* in Table IV indicate that the state of existing bank relationships had the greatest influence upon issuer bank choices during the 1960s.
- Issuers' sensitivity to the state of a banking relationship declined most sharply in absolute value through the 1970s and continued to decline through the 1990s.
- As our estimate of concern for the state of banking relationships declined, the average relationship strength among the banks selected to lead securities transactions (Figure 1) declined sharply. The average dropped from its height of nearly 90% from the mid 1970s, and stabilized at around 65% in the 1990s; it then declined to nearly 50% by 2009.
- If we interpret the elasticity of issuer choice probabilities with respect to *RelStr* as a reflection of the contestability of investment bank relationships, then through the 1950s, relationships with the top five banks in the issuer choice set were not easily contested. By the 1960s, choice probabilities were elastic for moderately strong relationships and, increasingly, for exclusive relationships from the 1970s forward. Choice probabilities were more elastic among the remaining banks in the choice set throughout the sample period and at every level of *RelStr*.

In this section, we discuss how these time patterns correspond with changes in conditions that motivate investment-banking relationships and whether they are related to changes in the regulatory environment.

6.1. Market Forces that Undermine Long-Term Relationships

We argue in Section 2 that investment banks facilitate information exchange and pricing. This involves commitment over complex and hard-to-verify data in situations that are not susceptible to formal contract. Investment banks attract clients by maintaining a reputation that can underpin informal commitments. When transactional data is hard to publicize, an important component of an investment bank's reputation is *private*: that is, it is client-specific, and is maintained within a bilateral client relationship. Hence, it is in the best interests of clients that rely upon non-contractible information exchange to ensure that their investment bankers derive sufficient rents from their private relationships. In short, the parties to investment banking deals have the strongest incentives to sustain long-term relationships when business needs and the technological environment render informal commitment most important; 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.

It is conceivable that informational friction diminished over the course of our sample period.⁴³ However, several facts suggest that this was not the primary force driving the time pattern that we observe for investment-banking relationships. First, although issuing firms are more transparent now than at the beginning of our sample period, the most important changes in disclosure, the 1933-34 Securities Acts and the advent of the internet and electronic filing, bracketed our sample period. Moreover, 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. Coupled with the rise of institutional investing around mid-century, the gap between the best- and least-well-informed investors surely widened. Thus we focus our attention on forces that either raised the cost of informal agreements or improved the formal contracting environment.

Morrison and Wilhelm (2004) discuss organizational form when tacit information exchange and reputations are important. They argue that firms are best-able to maintain economically valu-

⁴³Even if the level of asymmetric information remained constant, the importance of certification might have declined among some issuers if a higher frequency of capital market participation provided incentive for them to develop their own reputation for credible representation of private information.

able client reputations when they are sufficiently small to enable employees to monitor one another, and when labor is relatively immobile and, hence, exposed to the long-term consequences of reputation loss. Those characteristics are embedded in the partnership form, where partners have particularly long-lived incentives by virtue of their equity ownership and the requirement that they sell their stake to the next generation of partners, which is particularly well informed about the business' long-term reputational prospects.

In line with this theory, investment banks operated as partnerships during the early part of our sample period. Investment banking firms were small, and their employees were immobile: investment banks were opaque so 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 3.2.4, bankers routinely served as partners in a single bank for decades. Figure 4 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.

Bankers with long-term ties to a single firm had the right incentives to form the relationships upon which reputational assets are built; at the same time, their clients favored long-term relationships as the best basis for profitable informal exchange of price-relevant information. One manifestation of long-run relationships was in service on client boards of directors. Table V provides a summary of board service from 1935 through 1949 for the 17 defendant banks in *U.S. v. Henry S. Morgan et al.*⁴⁴ 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,

⁴⁴The 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.

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.⁴⁵ As a point of contrast, 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 once again 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.⁴⁶

Finally, Figure VII shows that, with the exception of Merrill Lynch, the members of our eight-bank subsample remained quite small through the 1950s with the number of partners ranging from 20-45 in 1960. 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.⁴⁷ In summary, the conditions identified by Morrison and Wilhelm (2004) as supporting development and preservation of the institutional reputation at the core of investment-

⁴⁵These 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.

⁴⁶In 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."

⁴⁷Merrill'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).

banking relationships through at least the middle of the twentieth century.

We have already argued that investment bank reputations are most effectively built in small organizations, and that they are most valuable when there is no alternative means of committing. Morrison and Wilhelm (2008) demonstrate that we should expect firms in which there are substantial economies of scale to be less willing to adopt the partnership form, and we should expect partnerships to become relatively less important in industries within which new technologies facilitate new forms of arm's-length contract. Both of these conditions arose when batch-processing computing technology was introduced to retail investment banking. As a result, many of the tacit skills required to settle transactions were automated, while, at the same time, banks needed to operate at a large scale if they were to cover the fixed costs of the new technology.

These effects are illustrated in Figure 7. Starting in the late 1950s, as computerized data-processing capacity became more accessible (Morrison and Wilhelm 2008, pp. 329-30), the growth rates at Merrill Lynch, Dean Witter and E.F. Hutton began to diverge from those at other banks in our eight-bank subsample. These banks had the largest retail brokerage operations: they therefore had the most to gain from batch processing, which introduced economies of scale and displaced tacit, relationship-based, forms of commitment in their businesses. They were the first banks to sacrifice reputational incentives for scale by going public (Merrill in 1971, 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). By 1970, the average partner tenure in our eight-bank subsample had declined to 7.3 years.

As computers started to enable relationship data to be recorded, the relationship metrics of the 1950s and 60s started to erode. Alongside the early investment bank public offerings, industry observers began to comment for the first time on banker mobility and client account switching.⁴⁸ These observations are consistent with the time patterns that we observe in *RelStr*, *Tenure*, and *Experience* as well as the sharpest change in the degree to which issuers conditioned on the state of their relationships with banks. It is worth noting that the elasticities reported in Figure 6 might be interpreted as foreshadowing these changes in the sense that they provide the first indication

⁴⁸See Thackray (1971) and Thackray (1972).

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 even among their exclusive relationships.

The first wave of investment bank IPOs coincided with advances in computing technology that enabled more formal commitment in retail investment banking. The 1980s was further advances in computing and financial engineering that transformed many elements of wholesale banking. Fast real-time computing enabled the introduction of new derivatives contracts that shifted much business from the tacit to the codified realm; they also enabled individual bankers to manage many more relationships and, hence, to operate at a much larger scale. Once again, the scale tipped against traditional relationship-based modes of business within the partnership and in favor of IPOs. Wholesale banks started to float and, by 1987, all of the major banking partnerships, with the exception of Goldman and Lazard, had gone public or were acquired by publicly-held firms.

Wholesale bank IPOs occurred because reputations and, by extension, the relationships upon which they were built, were rendered less important by new information technologies. And, to the extent that they were less concerned to maintain close relationships, clients were more willing to respond to competition from alternative underwriters and advisors. Similarly, because tacit relationships were less important to clients, investment banks experienced fewer sanctions when they violated the terms of those relationships. Consistent with this argument, the vast majority of bank-client relationships for which *RelStr* was at least 50% during the 1980s were characterized by elastic choice probabilities, many of them highly elastic.

As relationships became weaker, the mergers and acquisitions advisory business changed. M&A advice had traditionally been tendered without direct compensation and in the expectation that it would eventually be rewarded by long-run income elsewhere in the relationship. As relationships became weaker in the 1960s and 70s, banks started to charge directly for M&A advice. M&A advice became an important revenue source after the 1978 Bankruptcy Code enabled banks to assume a more active role in corporate reorganizations, and as the market to junk bonds further expanded the market: 35,000 mergers were completed in the U.S between 1976 and 1990 (Morrison and Wilhelm 2007, pp. 251-262). Hostile takeovers accounted for 172 of the successful transac-

tions between 1976 and 1990. They were viewed from the onset as an affront to client relationships. Goldman Sachs, which remained a partnership and maintained a tacit, relationship-based business, refused to represent hostile bidders;⁴⁹ other firms, which had jettisoned the partnership form, did not.

The 1970s and 1980s also witnessed complementary advances in computing power and financial engineering (Morrison and Wilhelm 2008) that triggered an unprecedented wave of financial innovation. Functions that previously had been the exclusive preserve of well-established banks with high behavioral reputations became contestable by new entrants with the skills required to exploit these advances. Human capital in these primarily nonadvisory functions was amplified by computing technology, giving rise to increased demand for skilled labor, rising relative wages (Philippon and Reshef 2012), and increasing skewness in compensation. Chen, Morrison, and Wilhelm (2014) argue that technological change and competitive pressure in this setting can further weaken concerns for maintaining a behavioral reputation as talented bankers seek to set themselves apart from less talented peers even if doing so cuts against their clients' interests. To the extent that behavioral reputation is private or client-specific, incentives for maintaining a bilateral client relationship are weakened.

6.2. Regulatory Interventions and the Decline of Relationships

The March 1982 implementation of Rule 415, which provided for shelf registration of securities offerings, is the only regulatory intervention that appears to have been a significant threat to investment-banking relationships through at least the late 1980s. 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

⁴⁹See Armour and Skeel (2007). John Whitehead justified Goldman's policy of not working for hostile bidders during this period “partly as a matter of business ethics, but primarily as a matter of business judgment” (Ellis 2009, p. 271). Note that it was also during the runup to this period that Whitehead felt the need to memorialize Goldman's 14 business principles that began with the epigraph of the paper.

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). Moreover, 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 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.⁵⁰ It was not until January 18, 1989 that commercial banks could gain approval for underwriting of corporate debt. The Fed did not grant equity underwriting powers to commercial banks until September 1990.

But 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.⁵¹ 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*,

⁵⁰Note that commercial paper transactions do not appear in our dataset.

⁵¹The gross revenue restriction for high risk transactions was raised to 10% in September of 1989.

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 during the decade. To test whether this short period of limited commercial bank participation influenced the estimation results for the 1980-1989 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 V 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. Figure 1 shows that the strength of investment-banking relationships actually leveled off during the 1990s before turning down again in the 2000s. Similarly, the sensitivity of issuers to this attribute leveled off as evidenced by the considerable overlap in the confidence intervals for the coefficient estimates for *RelStr* during the 1980s and 1990s. 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, the apparent stabilization of relationships during the 1990s 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).

From perspective of market share concentration, it is not obvious that competition has changed markedly. If we look across the 7 estimation periods at the level of concentration of market share in each nest (see the appendix) there is some variation across decades but not a strong trend. Moreover, it does not appear that there was a marked change in the identity of top 5 banks, at least before the (re)entry of commercial banks.

7. Conclusion

In this paper 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. At the same time, issuer's placed more emphasis on a bank's connectedness with other banks as evidenced by syndicate participations, especially from 2000-2007. We associate these patterns with structural changes in financial markets around mid-century that undermined bank-client relationships and required banks to develop new capacity in response to the rise of institutional investors. We also show that issuer's favored banks with industry-specific expertise as evidenced by the strength of the bank's relationships with firms within the issuer's SIC category. This effect is much smaller than the other two and it declined substantially post-1980.

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. In this setting a bank's reputation for trustworthy behavior can give rise to a strong (relatively exclusive) client relationship. We argue that our evidence is consistent with structural changes in financial markets weakening reputation concerns among banks and diminishing issuers' perception of the value of an existing bank relationship. The weakening of the influence of bank relationships on issuer decisions was greatest immediately following the NYSE's decision to permit public ownership of member firms, a decision that was triggered by the confluence of new technology and a sharp increase in (institutional) trading activity. At the same time, turnover among key bankers increased and we show that this had a negative bearing on issuers' bank choices independent of our measure of the state of a bank's relationship with the issuer.

We argue that the rise of institutional investors also helps to explain the growing influence of syndicate connections by placing a premium on banks' (syndicates') capacity for reaping benefits for issuers from institutions' greater incentives for (costly) information production. However, syndicate connections gained their greatest influence over issuers' bank choices during the last two decades, well after institutional investors gained a dominant role in the marketplace. We suggest that this too could be a reflection of diminishing confidence in banks as co-management provides issuers with a means to better monitor the behavior of their lead bank.

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 improve policy responses to future structural change in financial markets.

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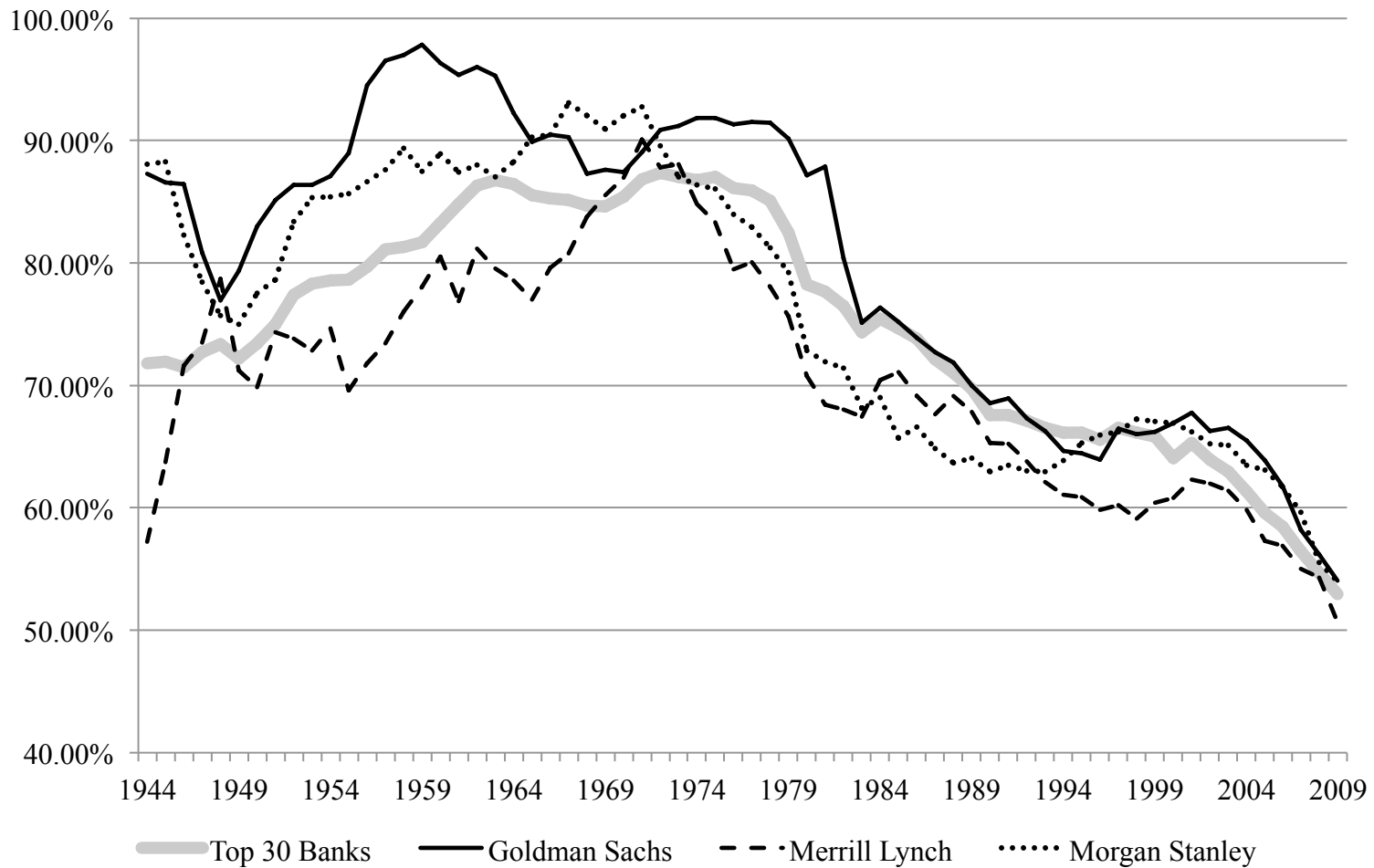


Figure 1. Bank-Firm Relationship Exclusivity. The figure reports an annual measure of a bank's average relationship strength among firms for which the bank managed a deal during the preceding 10 years. Relationship strength is the bank's share of proceeds raised by a firm during the 10-year rolling window. 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.

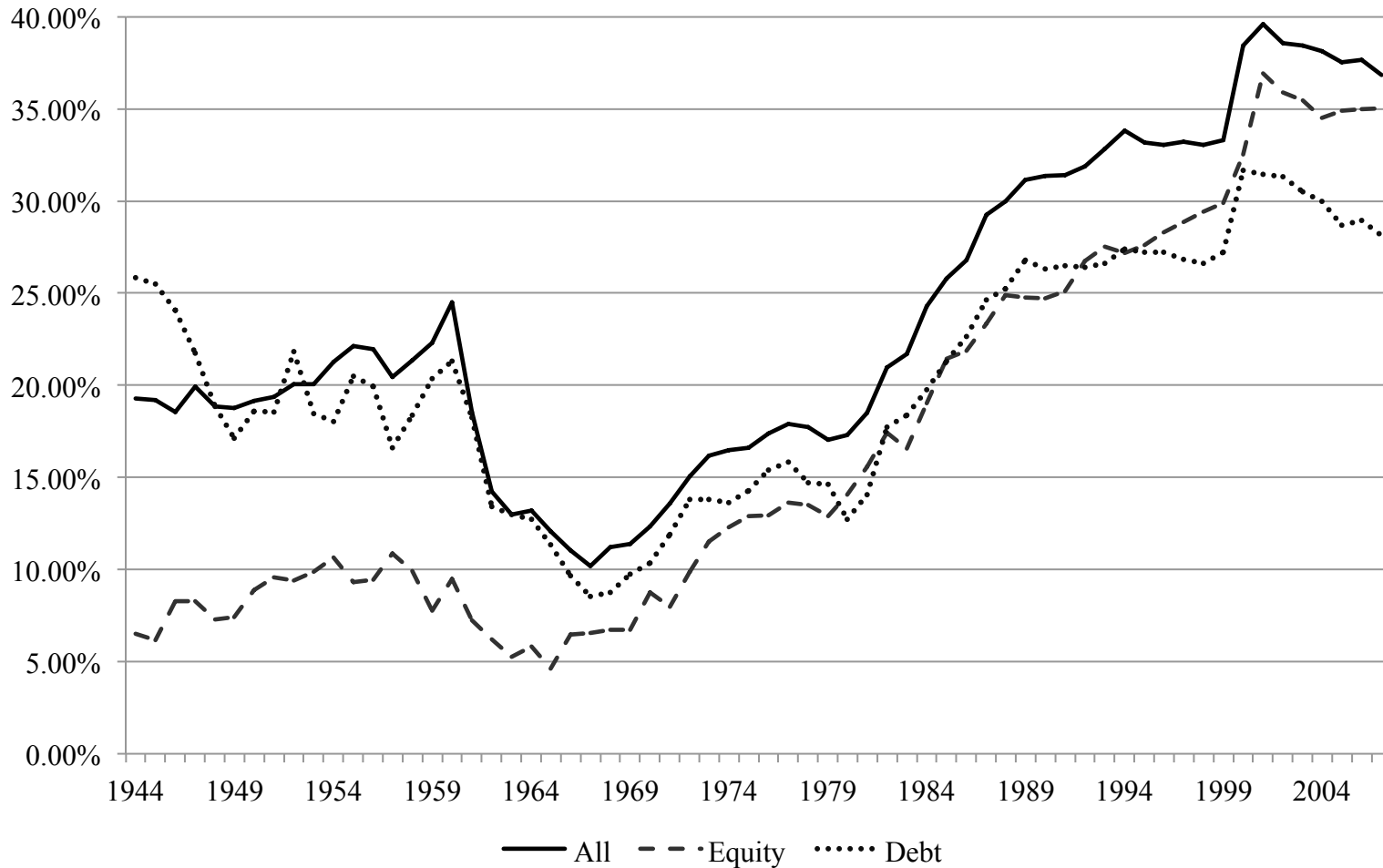


Figure 2. Bank-Firm Relationships within SIC Categories. The figure reports the fraction of banks with multiple clients within a four-digit SIC category, conditional on a bank having at least one client in the industry category. A bank is identified as having a client in an SIC category in a given year 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.

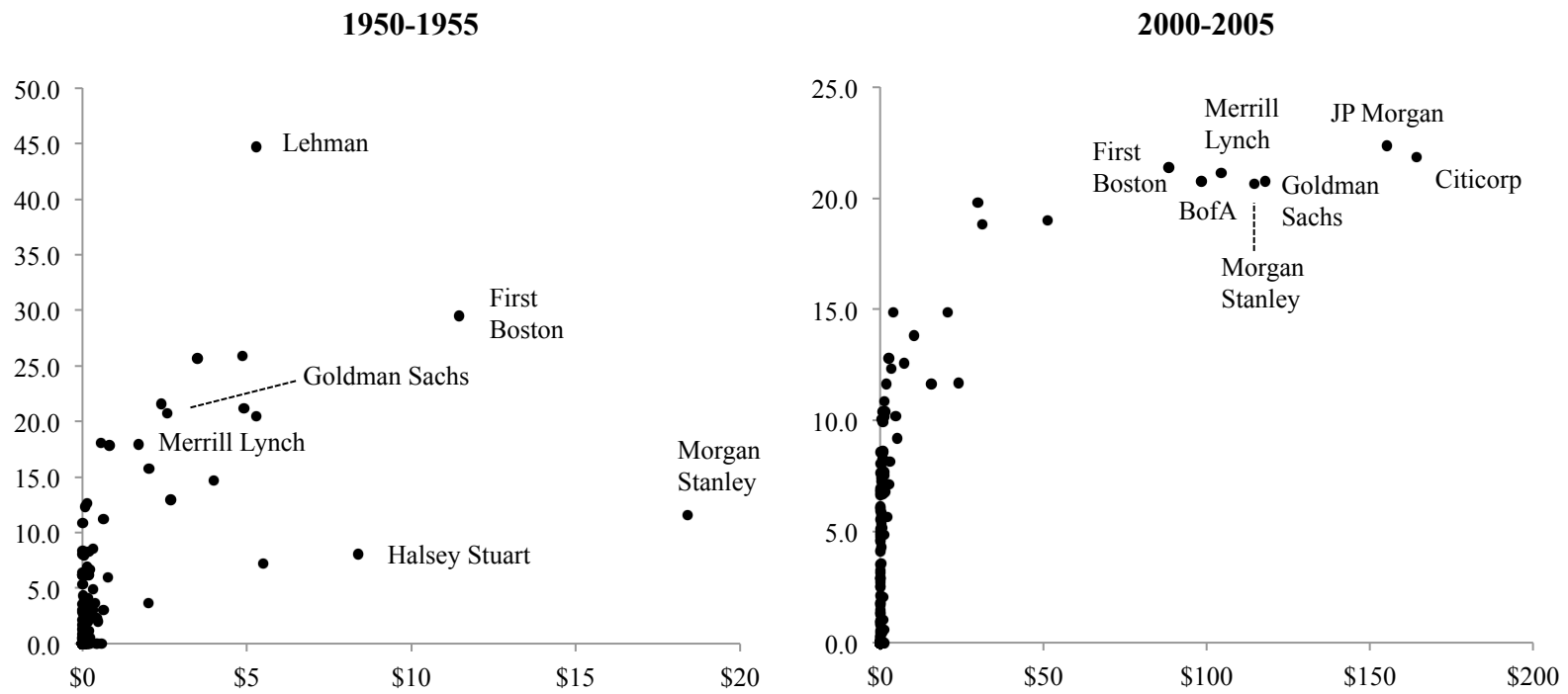


Figure 3. Relationship between EVC and Underwriting Volume. The figure plots banks' eigenvector centrality (EVC) against their underwriting volume for the time periods 1950-1955 and 2000-2005. Underwriting volume is the total proceeds managed by the bank (\$m) during the time period. EVC is measured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

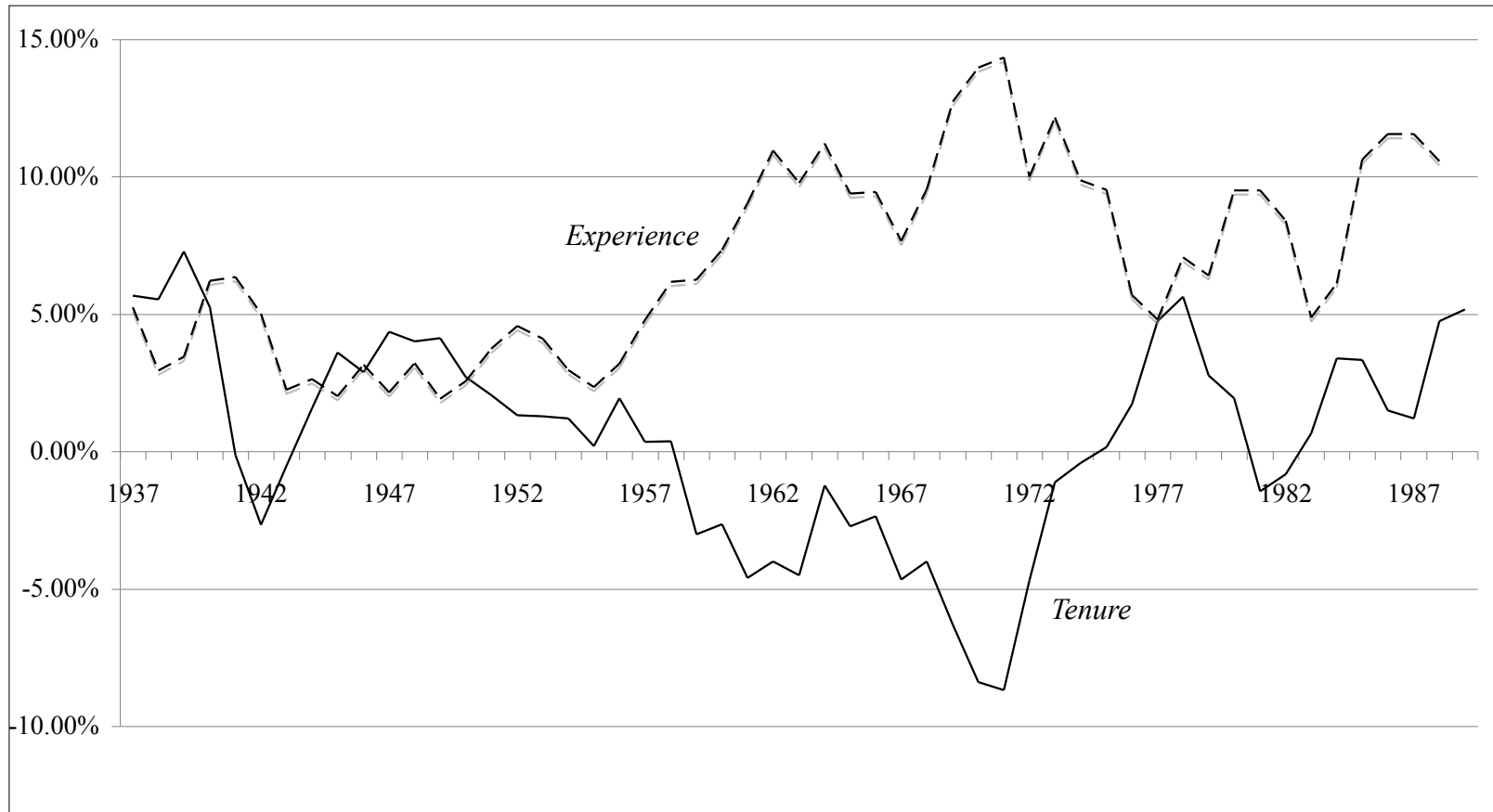


Figure 4. Bank Partner Tenure. The figure reports two measures of change in the annual number years of bank partner experience averaged across a subset of 8 banks (Dean Witter, E.F. Hutton, Merrill Lynch, Smith Barney, Goldman Sachs, Lehman Brothers, Morgan Stanley, and Salomon Brothers). *Experience* 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.

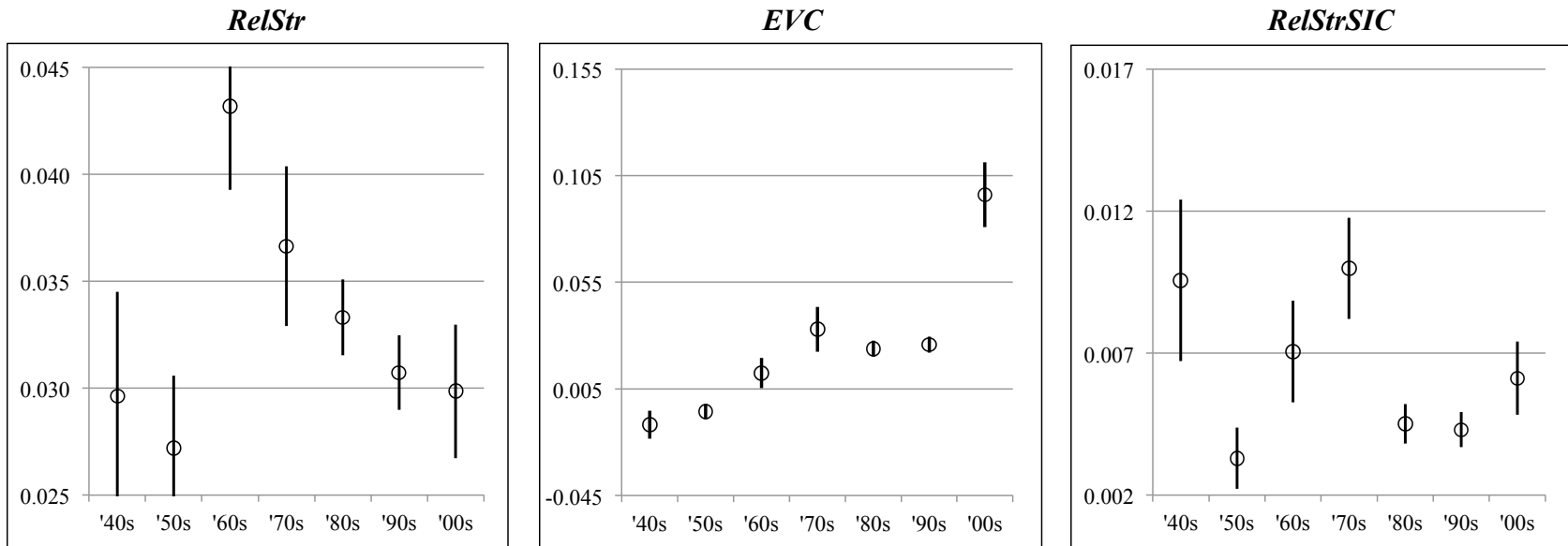


Figure 2. Estimated Coefficients and Confidence Intervals. This figure plots the estimated coefficients and confidence intervals for bank-specific attributes for the full-sample model specification of the bank choice model reported in Table V.

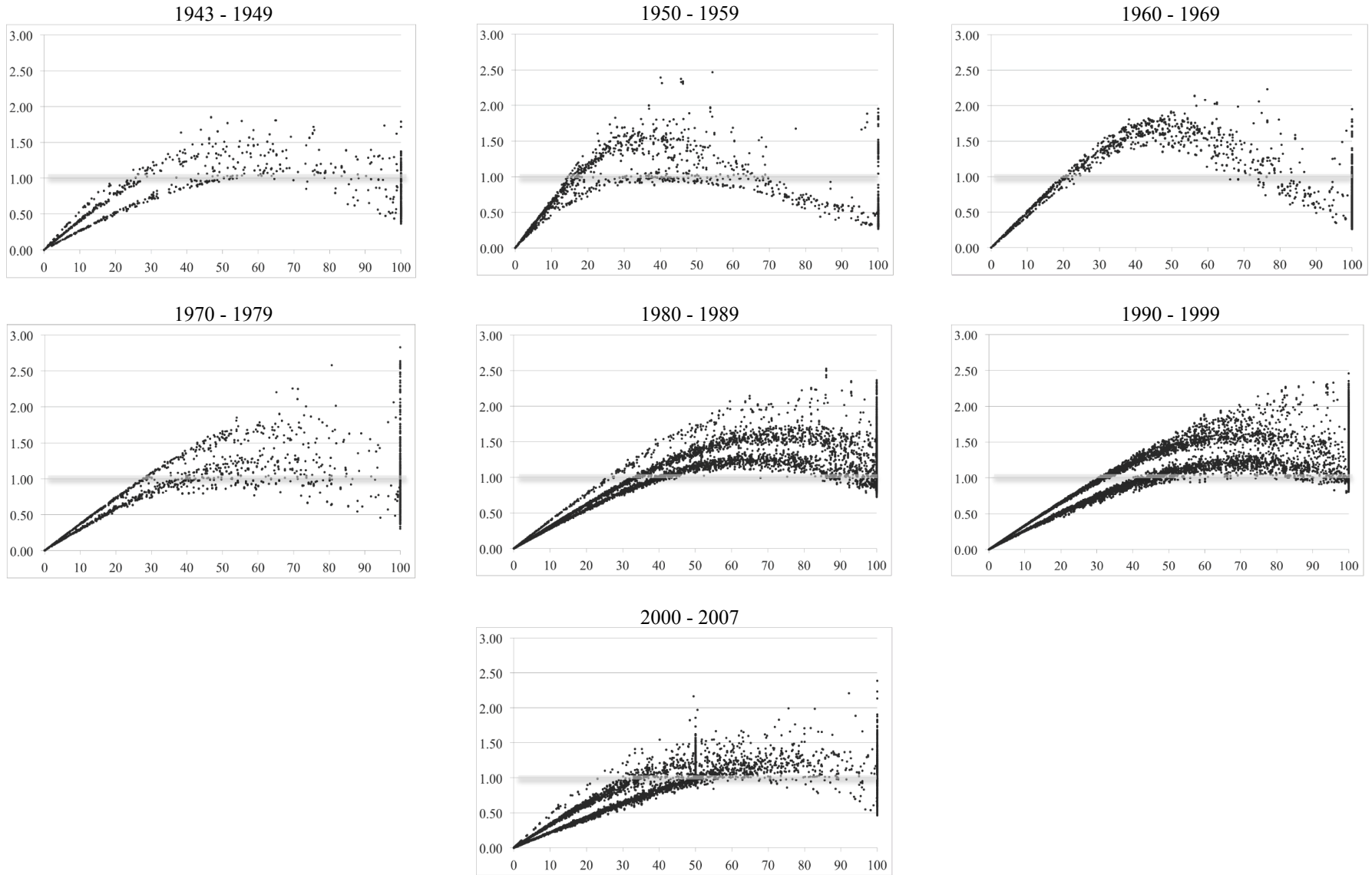


Figure 6. Choice Probability Elasticities With Respect To *RelStr*. During each estimation period we calculate choice probability elasticities with respect to *RelStr* for each bank in the choice set for each transaction. Elasticities are pooled across transactions and banks and then plotted against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

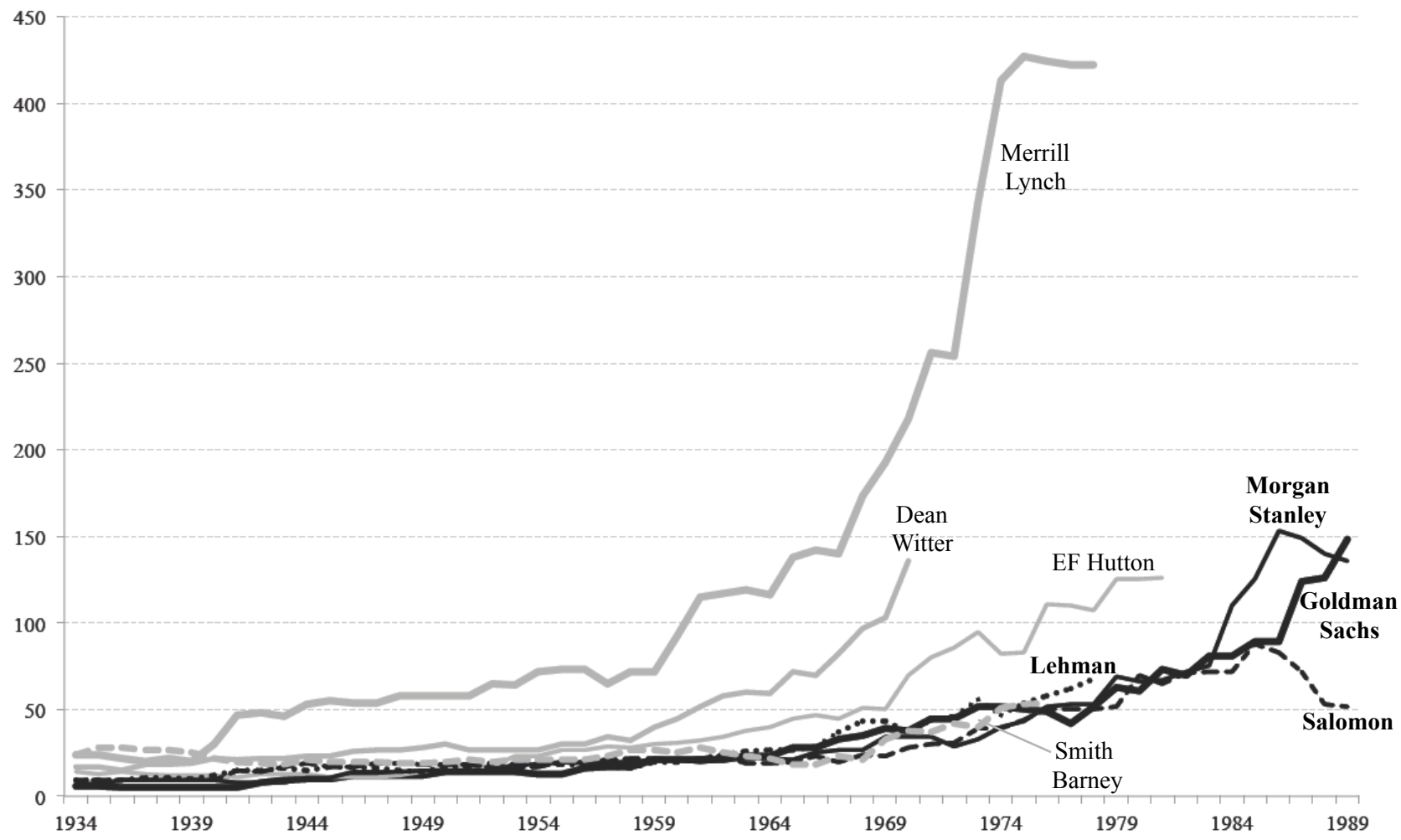


Figure 7. Number of Partners. This figure plots the number of partners on an annual basis for the 8-bank subsample. Goldman Sachs, Lehman, Morgan Stanley, and Salomon comprise the “wholesale” bank group in the nested logit analysis. Dean Witter, EF Hutton, Merrill Lynch, and Smith are assigned to the “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
Total Number of Transactions	842 230 (27%)	612 (73%)	1,217 259 (21%)	958 (79%)	2,164 810 (37%)	1,354 (63%)	2,602 1,256 (48%)	1,346 (52%)	10,311 4,830 (47%)	5,481 (53%)	12,574 4,647 (37%)	7,927 (63%)	3,867 1,681 (43%)	2,186 (57%)
Equity	193 88 (46%)	105 (54%)	172 56 (33%)	116 (67%)	724 415 (57%)	309 (43%)	1,061 724 (68%)	337 (32%)	2,551 1,444 (57%)	1,107 (43%)	4,190 2,420 (58%)	1,770 (42%)	1,658 854 (52%)	804 (48%)
Debt	516 98 (19%)	418 (81%)	1,000 193 (22%)	807 (81%)	1,399 387 (28%)	1,012 (72%)	1,494 524 (35%)	970 (65%)	7,179 3,037 (42%)	4,142 (58%)	7,858 1,873 (24%)	5,985 (76%)	1,865 550 (29%)	1,315 (71%)
Preferred	133 44 (33%)	89 (67%)	45 10 (22%)	35 (78%)	41 8 (20%)	33 (80%)	47 8 (17%)	39 (83%)	581 349 (60%)	232 (40%)	526 354 (67%)	172 (33%)	344 277 (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 Relationship 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. The log of transaction value and the number of transactions brought to market by the issuer since 1933, appear as transaction-specific variables in the ASCLogit and NLogit specifications (along with 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	
	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected	Not Selected	Selected
<i>RelStr</i>	1.14 (1.41)	32.79*** (40.71)	1.15 (1.28)	40.11*** (40.11)	0.68 (1.16)	41.28*** (44.23)	0.76 (1.29)	28.01*** (41.01)	0.95 (1.40)	23.04*** (38.28)	1.36 (1.47)	19.87*** (33.23)	1.12 (1.37)	17.70 (31.84)
<i>RelStrSIC</i>	13.61 (9.17)	44.24 (36.63)	18.69 (9.96)	51.46*** (35.03)	10.00 (9.74)	43.77*** (42.55)	13.80 (11.98)	43.50 (42.75)	20.08 (14.19)	43.82*** (40.87)	26.36 (15.95)	45.33 (35.75)	17.77 (11.10)	46.67 (34.29)
<i>EVC</i>	12.14 (0.91)	12.49 (10.52)	13.34 (0.56)	14.48*** (9.70)	13.99 (0.56)	16.63*** (8.66)	14.31 (0.52)	18.72*** (5.97)	12.56 (0.65)	16.98*** (7.50)	11.68 (0.71)	15.21*** (6.00)	8.95 (1.33)	15.66*** (3.95)
Bank's Rank within the Issuer's Choice Set	15.71 (8.62)	9.29 (7.18)	15.75 (8.60)	8.29 (6.84)	15.62 (8.65)	12.13*** (8.01)	15.72 (8.61)	9.20 (7.48)	15.72 (8.61)	9.15 (7.58)	15.72 (8.60)	9.22 (7.96)	8.95 (1.33)	15.66 (3.95)
Transaction Value (\$m)	69.50 (105.00)		66.70 (130.00)		75.60 (158.00)		138.90 (206.00)		104.60 (218.00)		134.20 (266.00)		140.10 (212.00)	
Transactions to Date (from 1933)	6.10 (8.66)		11.78 (14.66)		10.02 (17.51)		6.21 (15.92)		5.17 (10.67)		16.11 (33.28)		38.37 (101.22)	
Number of Transactions	842		1,217		2,164		2,602		10,311		12,574		3,867	

Table V
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. *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. *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 χ^2 test statistic for goodness of fit with (n) degrees of freedom.

Estimation Period	<i>RelStr</i>	<i>EVC</i>	<i>RelStrSIC</i>	<i>Tenure</i>	<i>Experience</i>	Transactions	χ^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)	-3.448* (1.84)		242	39(7)
	0.030*** (0.008)	-0.006 (0.004)	0.004** (0.002)		-0.070 (0.627)	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)	-5.004*** (1.939)		511	86(7)
	0.052*** (0.009)	-0.010 (0.008)	-0.000 (0.002)		7.724*** (2.102)	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)	1.914** (0.855)		823	107(7)
	0.045*** (0.005)	0.020*** (0.005)	0.006*** (0.001)		-0.752 (0.612)	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)	0.845** (0.416)		1,364	222(7)
	0.032*** (0.002)	0.031*** (0.006)	0.006*** (0.001)		-2.111*** (0.444)	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)	-1.063*** (0.303)		2,556	395(7)
	0.028*** (0.002)	0.134*** (0.015)	0.002*** (0.001)		0.678** (0.309)	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
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 report 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 remained as a director at the end of the reporting period (usually year-end 1949).

	Bankers	Directorships	Director Years	Average Years per Director	≥ 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			

8. Appendix

The appendix includes historical background and a timeline (Figure A.1), details of the 1933-1969 data collection process, the formal definition of eigenvector centrality used to calculate *EVC*, 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), and results for transaction-specific variables included in the nested logit models (Table A.III) reported in Table IV.

8.1. Historical Background

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 incorpo-

rate 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).⁵²

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."⁵³

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 be subject to competitive bidding. The new rules had the desired effect in the sense that they enabled

⁵²Carosso (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.

⁵³"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).

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.⁵⁴ 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 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

⁵⁴The 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).

placements, to the point of crowding out investment banks by investing in direct placements.⁵⁵

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.”

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. Investment banks went public in two waves (Morrison and Wilhelm 2008). Most banks with substantial retail brokerage operations had gone public or combined with a public firm by the end of the 1970s. By 1987, among the major wholesale banks, only Goldman Sachs and Lazard remained private partnerships.

⁵⁵See Kemmerer (1952), Carosso (1970, pp. 499-501), and Sobel (1986, p. 64).

As we note above, 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). Hostile takeovers were viewed from the outset as an affront to client relationships.⁵⁶

At the same time as client relationships were placed under stress by banks' advisory work for hostile bidders, the SEC, in March 1982, implemented Rule 415, which provided for shelf registration of securities offerings, with the explicit intention "to produce a decline in the market power of bankers in their relationship with issuers." (Calomiris and Raff 1995, p. 121). 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 may have had the desired effect. From March, 1982 through May, 1983 there were 508 shelf registrations worth a total of \$79.3 billion. About 25% of equity offerings between 1982 and 1983 appearing in the sample studied by Denis (1991) were shelf registered.

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. It was not until January 18, 1989 that commercial banks gained approval for limited underwriting of corporate debt. As of September 1990 only J. P. Morgan (11), Citibank (14), Chemical Bank (17), Bankers Trust (19), and First Chicago (20) ranked among the top 20 debt underwriters. The Fed did not grant equity underwriting powers to commercial banks until September 1990 (Benveniste, Singh, and Wilhelm 1993). The 1933 Banking Act was repealed in 1999 by the Gramm-Leach-Bliley Act.

⁵⁶See Armour and Skeel (2007). John Whitehead justified Goldman's policy of not working for hostile bidders during this period "partly as a matter of business ethics, but primarily as a matter of business judgment" (Ellis 2009, p. 271).

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

8.2. 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,⁵⁷ the date of the offering,⁵⁸ 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.⁵⁹ 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 as-

⁵⁷The 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.

⁵⁸The transaction dates for some deals do not include a day; these transactions are assumed to occur on the first day of the month.

⁵⁹For 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.

signed 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.⁶⁰ 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.

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 4911.⁶¹ Using these methods, we were able to identify SIC codes for 25,088 out of 49,155 transactions between 1933 and 1969.

⁶⁰Generally, this occurred when commas were misplaced: for example, we excluded data that included numbers recorded as 1,00,000.

⁶¹Specifically, 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. Railroad 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.

8.3. 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:

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

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

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

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

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

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

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

That is, any set e_1, e_2, \dots, 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.

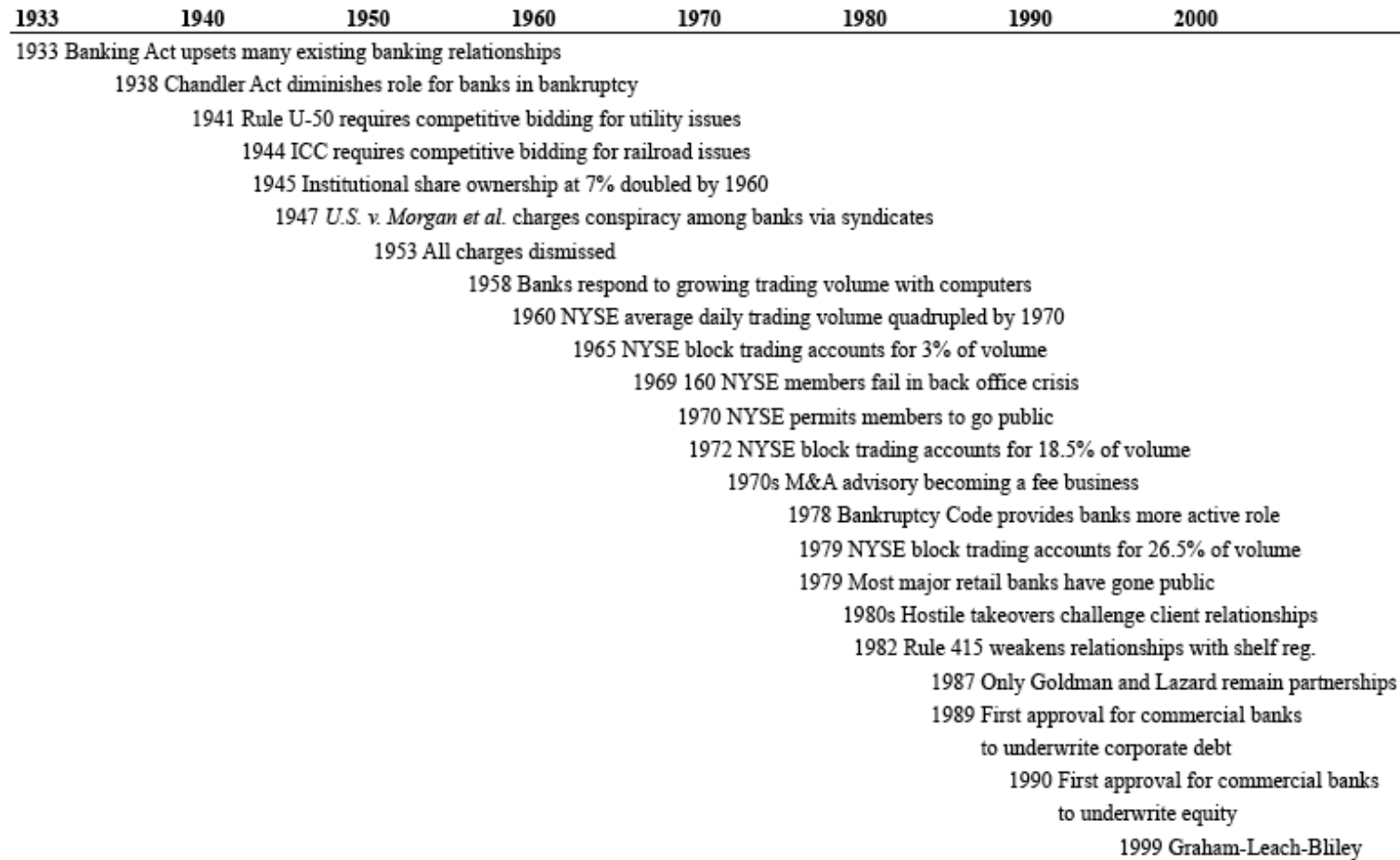


Figure A.1 Historical Timeline

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.

	Market Share	Nest Share		Market Share	Nest Share		Market Share	Nest Share		Market Share	Nest Share
1940-1949			1950-1959			1960-1969			1970-1979		
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	

	Market Share	Nest Share		Market Share	Nest Share		Market Share	Nest Share
1980-1989			1990-1999			2000-2007		
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 conditional 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) coefficients 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 χ^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 χ^2 test statistic are not directly comparable those reported for the CLogit and ASCLogit specifications.

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

Table A.III

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