



American Finance Association

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Source: *The Journal of Finance*, Vol. 48, No. 5 (Dec., 1993), pp. 1659-1692

Published by: Blackwell Publishing for the American Finance Association

Stable URL: <http://www.jstor.org/stable/2329063>

Accessed: 25/11/2009 11:39

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Issue Size Choice and “Underpricing” in Thrift Mutual-to-Stock Conversions

VOJISLAV MAKSIMOVIC and HALUK UNAL*

ABSTRACT

Issue size choice and underpricing in mutual-to-stock conversions of thrifts are explained as a function of growth opportunities, perquisite consumption, and proprietary information. We provide evidence that thrifts with greater growth opportunities choose larger issue size and experience higher after-market price appreciation. This finding persists when we allow for investors' inferences about managers' proprietary information. Variables that explain underpricing in typical initial public offerings are significant by themselves but lose significance when combined with the issue size choice variables. Managerial holdings and the offer price do not act as dissipative signals of value in thrift conversions.

A THRIFT INSTITUTION THAT is mutually owned by depositors can become a joint stock firm by offering its accumulated mutual equity for sale. Since the Federal Home Loan Bank Board (FHLBB) moratorium on mutual-to-stock conversions was ended in 1976 and the remaining restrictions were relaxed by the passage of the Garn–St. Germain Act of 1982, the number of conversions has increased dramatically.¹ During the 1975 to 1988 period, 707 FSLIC-insured mutual thrifts converted to stock ownership, raising \$10.7 billion in equity capital. Most of these conversions were completed during the 1983 to 1988 period, when 571 thrifts converted and raised \$10.1 billion. This major organizational change is far from being over. At the end of 1989 there were 1,471 FSLIC-insured mutual thrift institutions with assets worth \$286

* College of Business and Management, University of Maryland at College Park. Maksimovic's research was supported at the University of British Columbia by a grant, number 410–92–1643, from the Canadian Social Science Research Council. We would like to thank Larry Cordell, Espen Eckbo, Mark Flannery, Mason Gerety, Edward Kane, Kathy Kuester, and Rex Thompson for helpful comments; James Barth, Larry Cordell, Larry Fleck, Leonard Lapidus, Chan-Jane Lin, Jay Ritter, and James Thomson for providing data; and Sandra Betton, Rex duPont, Keith Price, Charles Lahaie, and Eric Surette for excellent research assistance. Detailed comments from René Stulz (the editor) and an anonymous referee substantially improved the paper. We are also grateful to seminar participants at the London School of Economics, University of Maryland, University of British Columbia, UCLA, Board of Governors of the Federal Reserve System, University of Oregon, University of Texas at Dallas, the Securities and Exchange Commission, the Office of Thrift Supervision, and the Western Finance and Financial Management Association Meetings for their comments.

¹ FHLBB was replaced by the Office of Thrift Supervision (OTS) and the Federal Savings and Loan Insurance Corporation (FSLIC) was eliminated by the passage of the Financial Institutions Reform Recovery and Enforcement Act of 1989.

billion. In view of higher capital requirements and the position taken by regulators that conversions are a means of recapitalizing a troubled industry, hundreds of these institutions are likely to convert to stock form.²

Thrift conversions are closely regulated by the FHLBB and its successor, OTS. The regulations in force since 1975 permit mutually organized thrift institutions to convert into a stock organization under the "sale-of-stock" approach. This approach requires that mutual equity be sold to investors, with management and eligible depositors having priority in purchasing.³ Importantly, the proceeds from the equity sale are not distributed to the existing depositors who are legally the "owners" of the mutual thrift, but instead become an addition to the thrift's assets. Thus, as a class the investors who purchase the equity of a converting thrift acquire the equity ownership of the *entire* thrift, including the capital raised by the sale of the mutual equity.

Three regulatory requirements are of particular significance in differentiating conversions from typical initial public offerings (IPOs) examined in the literature on underpricing.⁴ First, a converting thrift must sell its entire equity at one price, so that all investors acquire shares on the same terms. Thus, a conversion is both an initial stock offering and an initial public offering. As a result, potential conflicts of interest between insiders and investors in conversions differ from those present in other IPOs, where insiders typically do not purchase their equity stake at the time of the public offering. Second, a required independent appraisal provides a range for the total value of the offering. Management chooses the actual value of the offering within this range. Third, as Masulis (1987) recognizes, the requirement that the proceeds of the sale of equity be retained as part of the thrift's assets implies that after-market stock price appreciation ("underpricing") may occur even if there are no asymmetries of information between insiders and investors. This is because in return for contributing capital, the equityholders obtain claims both to the mutual equity and to the capital they have contributed. Thus, stock price appreciation in thrift conversions may be determined by the value of the mutual equity and of growth opportunities to be undertaken with the issue proceeds, and is not necessarily the result of informational asymmetries analyzed in the IPO literature.

This paper provides a cross-sectional time series analysis of the relationship between after-market price performance of public offers in thrift conversions and the issue size choice. We argue that the management's choice of issue size, within the range provided by the appraiser, reflects the value of growth opportunities and conflicts of interest between managers and investors. Managers of mutual thrifts undergoing conversions are both potential investors and potential consumers of managerial perquisites. As investors,

² See Carron (1982) and Kane (1989) for a discussion of industry conditions in the eighties.

³ Eligible depositors receive subscription rights in proportion to their deposit balances.

⁴ We describe the regulations in detail below.

their objective is to maximize after-market returns. In maximizing returns they face a tradeoff between reducing the issue size, thereby reducing their cost of purchasing equity claims to the thrift's assets in place, and increasing the issue size, thereby raising additional funds for expansion.⁵ In addition, as consumers of perquisites, managers have an interest in increasing the thrift's assets to facilitate the consumption of perquisites. We analyze how these incentives affect the issue size choice and returns earned by initial investors.

Our framework also enables us to analyze how key variables identified in the IPO literature, such as the reputation of the underwriter and the offer price per share, affect after-market price performance in conversions.⁶ The IPO literature suggests that a relationship exists because these decisions convey information to potential investors about the quality of the issue, thereby preventing their exploitation by the better-informed insiders. In most extant studies the theoretical prediction that IPO decisions convey information to the market are usually not tested against a specific alternative hypothesis.⁷ Instead, in the absence of alternative models, these conjectures are frequently tested by examining the covariation between after-market price performance and specific decisions for a cross section of firms. By contrast, our framework suggests a relationship between underpricing and publicly observable information for some parameter values. Thus, we are able to test the effect of decisions identified in the IPO literature as reducing uncertainty against specified alternatives.

Our tests focus on a sample of thrift conversions completed over the 1980 to 1988 period. In addition to the standard ordinary least squares (OLS) technique, we also use an estimator discussed in Eckbo, Maksimovic, and Williams (1990) to model explicitly the market's inferences in determining underpricing.⁸ This latter estimator allows for the management's incentives to use private information and addresses the sample selection bias that may affect OLS estimators of cross-sectional effects in event studies.

The paper is organized as follows. Section I describes the regulatory treatment of conversions. Section II outlines a framework for analyzing underpricing in conversions and discusses its empirical implications. The data are described in Section III. Our cross-sectional model of underpricing is tested in Section IV and compared to that suggested by the IPO literature in Section V. The limited dependent variable estimates of the empirical model are presented in Section VI. Section VII concludes.

⁵ The causes of conversions from a mutual to a corporate charter have been examined by Masulis (1987). He finds that the primary motive for conversions is to obtain additional capital to exploit growth opportunities. The requirement for additional capital arises because a thrift institution cannot increase deposits and expand operations unless it meets the statutory minimum capital ratio.

⁶ Important empirical contributions to this literature include Ibbotson (1975) and Ritter (1984, 1987). The literature is reviewed in Tinic (1988).

⁷ For example, the hypothesis that a particular decision is correlated with a credible announcement of the firm's financial position.

⁸ See also Acharya (1988) and Lanen and Thompson (1988).

I. The Conversion Process

Under the sale of stock approach, a standard conversion proceeds in three steps.⁹ First, the conversion must be approved by the thrift's board of directors, the OTS, and depositors. During this first step, the institution obtains an independent appraisal prepared according to the regulatory *Guidelines* (FHLBB (1983)). The appraisal is prepared by an outside advisor and contains a point estimate of the value of the conversion offering and a range around this estimate. The maximum and minimum of the range are 15 percent above and below the mid point. As noted by Williams (1990, chapter 7.02 [1]), the OTS "generally requires that the potential range be expressed as a range in the price for a fixed number of shares."

The appraisal *Guidelines* require the appraiser to value the thrift by comparing it with a sample of similar thrifts that are publicly traded, taking into account the intended use of the newly raised capital. The appraiser thus first selects an appropriate sample of comparable firms and adjusts their financial statements to make them consistent. Then the appraiser uses the sample's price-earnings ratio, and market-book value multiples for assets and equity to obtain an estimated market value for the thrift's equity.

During the second step of the conversion process, shares are offered to investors on a priority basis. Share subscription priority is specified by conversion regulations. In principle, eligible depositors have first subscription priority. Maximum purchase limits are usually established at between one and five percent of the offering. However, management can establish additional priority categories which may purchase stock exceeding these limits.¹⁰ A final priority category may be established from noneligible account holders, and it is subject to general purchase limitations.

Priority investors are asked to subscribe at the maximum of the appraisal range. The difference, if any, between the maximum price and the price in the public offering is either applied to the purchase of more shares or is refunded after the public offering, depending on the investor's stated preference at the time of the subscription.

The final step of the conversion process is an underwritten public offering of the shares not taken up by subscribers. This offering must occur within 45 calendar days of the last day of the subscription offering.¹¹ In our sample all

⁹ During our sample 1980 to 1988 period the regulations that governed the conversion process and the post-conversion period safeguards and restrictions were set out in the Code of Federal Regulations (12 C.F.R., section 563(b)). For a detailed discussion of the process see Dunham (1985) and Williams, Fleck, and Comizo (1987).

¹⁰ For example, although eligible account holders have the first subscription priority, a 1986 regulation permits tax-qualified employee stock benefit plans that have priority over eligible account holders to purchase up to ten percent of the conversion stock offering. Also, if there are concerns about possible takeovers, management has the option to establish a subscription category for directors, officers, and employees with a purchase limit of between 15 and 25 percent (depending on the size of the thrift) of the total number of shares offered.

¹¹ 12 C.F.R., section 563 b.7(e, i). For very small thrifts where an underwritten offering is not feasible, the public offering may be a community offering limited to local residents.

the issues are underwritten on a firm commitment basis. The offer price of the public offering must lie within the previously estimated range and is determined just prior to the offering by negotiation between the thrift's management, the underwriter and the appraiser. The price must also be approved by the OTS immediately prior to the issue. In addition to selling the shares that are not subscribed, the underwriter may be granted a "greenshoe" or over allotment option of up to 15 percent of the *total* conversion offering "if the conversion appraiser deems the additional value supportable."¹²

II. Issue Size Choice and Underpricing in Thrift Conversions

The appraisal yields an estimate of the thrift's value and a range of values around this estimate. Management can affect the issue size P_0 within this range by negotiation with the underwriter and the appraiser. Since the thrift's ability to undertake growth opportunities is affected by its capitalization, management may choose an issue size that maximizes after-market returns earned by investors. However, since the management's welfare may also be directly affected by the thrift's capitalization, they may not pursue this objective. As discussed by Jensen (1986) and Stulz (1990), if there exists a relationship between perquisite consumption and firm size, management has an incentive to overinvest. For converting thrifts this is achieved by increasing the issue size. Similarly, if managers are more risk averse than investors, they may also have an incentive to choose an issue size in excess of that required to fund the available profitable growth opportunities. However, in this case the excess financial slack can be used to bolster the capital position of the thrift at the cost of reducing the after-market price appreciation. The issue size choice therefore depends on potential conflicts of interest between the managers and investors.¹³

We analyze the relationship between the issue size choice and the after-market stock price performance for two polar cases: (1) when managers have no incentive to increase the issue size beyond that which maximizes investors' returns and (2) when the managers' welfare is determined only by the issue size choice.¹⁴ We refer to the former case as that of *Aligned Interests* (AI), and to the latter case as that of *Perquisite Consumption* (PC).

The AI and PC cases are examined in turn under two different assumptions about information available to investors: that the appraiser, the managers, and the investors possess the same information and, alternatively, that

¹² Ibid, section 563 b.7 (g)(3) and Williams (1990, Chapter 7.02 [1]).

¹³ There may be other conflicts of interests between the management and investors that do not affect issue size. Such conflicts are beyond the scope of this paper. For a discussion of agency conflicts in stock and mutual banks see Rasmusen (1988).

¹⁴ This may be understood as the limit of the case where the manager's investment holdings are small in relation to perquisite consumption.

informational asymmetries exist so that managers are better informed than the other parties and exploit their informational advantage.^{15, 16}

A. Issue Size Choice and Underpricing When Manager and Investor Interests Are Aligned

As observed by Masulis (1987), initial investors may receive an uncompensated gain that is equal to the market value of the mutual thrift and the net present value (NPV) of its growth opportunities less any value transfers to the federal deposit insurance system arising from increases in equity capitalization. To see this, let $V(P_0)$ be the sum of the values of the thrift's mutual equity prior to conversion (V_0) and its growth opportunities ($PVGO(P_0)$), which are a function of the issue proceeds.¹⁷ In an efficient secondary market, the market price of the converted thrift's equity is $V(P_0) + P_0$. Hence, the observed dollar amount of after-offer price appreciation, which we call underpricing, is $V(P_0)$ and is thus an uncompensated gain to investors. Define ρ to be the "underpricing" as a fraction of the initial offer price, following the conversion. Then

$$\rho = \frac{V(P_0) + P_0}{P_0} - 1 = \frac{V_0 + PVGO(P_0)}{P_0}, \quad (1)$$

so that, in contrast to standard IPOs, there may be an after-market price appreciation even in the absence of informational asymmetries.¹⁸ From (1) it is also clear that the after-market price performance ρ is affected by the issue size, P_0 .

In the AI case with full information, when the manager and investor interests are aligned, management maximizes the returns from investment, ρ . We focus on two benchmark cases: when the thrift has positive NPV growth opportunities and when it does not. If the mutual thrift has positive equity value but does not have positive NPV growth opportunities the management can ensure that initial investors, including themselves, increase the return from investment ρ by minimizing the issue size, P_0 . In this case there is a negative relationship between the issue size choice and after-market price performance.

¹⁵ In mutually owned thrifts, mechanisms for control of management are weaker than in the case of publicly traded joint stock companies. For example, the managers of mutual thrifts are *not* required to provide dissident shareholders with shareholder rolls. As a result, they may be able to choose an issue size that does not maximize the value of a thrift even in the absence of informational asymmetries.

¹⁶ A more formal derivation of the statements below, for specific assumptions regarding growth opportunities and returns, is available from the authors.

¹⁷ Note that for ease of exposition we classify the changes in value of the subsidy provided by the deposit guarantee resulting from cash inflows as part of the thrift's "growth opportunities."

¹⁸ Note also that if the growth opportunities are large enough a thrift can experience price appreciation after conversion even if the value of its preconversion liabilities exceed its assets, i.e., if V_0 is negative. This is of significance in view of Carron's (1982) estimate that the aggregate value of liabilities in the thrift industry exceeded assets by \$44 billion in 1981.

If there are no transactions costs and if the financial market is strongly efficient, then the policy of minimizing the issue size is optimal even if future growth opportunities are taken into account. This is because growth opportunities can be exploited with funds obtained from a secondary issue without incurring any additional costs. However, in an imperfect capital market the option to finance growth by a later issue may be costly. First, if the thrift makes a secondary issue it forgoes economies of scale in the direct costs of the initial offering (i.e., underwriting, legal, and accounting fees).¹⁹ Second, if the initial offering is restricted, then the thrift will be issuing shares at a time when it already has equity outstanding. As a result, there may be conflicts of interest at the time of the second, seasoned issue between existing equityholders and potential investors. Such conflicts are significant because the thrift's insiders are likely to be better informed about the thrift's financial position, causing adverse selection in the seasoned issue market. As Myers and Majluf (1984) show, if asymmetries in information between equityholders and potential investors exist, then shareholders of firms with more valuable assets in place may suffer losses or may find it optimal to forego positive NPV growth opportunities altogether.²⁰

To avoid such costs in the future, if growth opportunities exist ($PVG_0 > 0$), it may be optimal for the thrift to increase the issue size and fully leverage up this additional equity.^{21,22} When there are growth opportunities, we make the following assumptions to obtain cross-sectional predictions: (1) when the choice of issue size maximizes investors' expected returns, a thrift that has greater growth opportunities earns a higher maximum expected return on initial investment than a thrift with smaller growth opportunities and that (2) this maximum expected return is attained at a larger issue size for thrifts with greater growth opportunities. These assumptions imply a positive relationship between the issue size choice and after-market performance, because, in terms of equation (1), for positive NPV growth opportunities ρ increases as P_0 becomes larger.²³

¹⁹ Ritter (1987) shows economies of scale in direct costs of IPOs are significant.

²⁰ Asquith and Mullins (1986) estimate that the median dilution of a seasoned offering is approximately 30 percent for a sample of industrial firms. Masulis and Korwar (1986) document significant negative price reactions if management is selling shares in a joint primary-secondary offer.

²¹ Note that slack is valuable even if at the time of the conversion managers cannot forecast the future value of assets in place or growth opportunities with more precision than other potential investors. All that is required for slack to be valuable is that at the time of the conversion it should be common knowledge that in subsequent issues insiders will have better information about the assets in place (e.g., status of loans) than other potential investors.

²² Assuming a 3 percent capital ratio requirement, a \$1 increase in equity capital makes it possible to borrow \$32.3 and invest in a \$33.3 project. The greater the available investment opportunities, the greater the need for more equity capital. Indirect evidence for the propensity to expand proposition is provided by the ratio of tangible net worth to total assets for a sample of 132 converting thrifts. This ratio increases from 2.37 percent immediately before conversion to 5.83 percent immediately after. In the subsequent five years it undergoes a monotonic decline to 2.11 percent.

²³ Recall that underpricing ρ is equal to the rate of return on initial investment.

Since the conversion issue is underpriced in equilibrium for positively valued thrifts, managers and the depositors have an incentive to invest. Managers are in general risk averse, hence there is likely to be a positive relationship between expected underpricing and the dollar size of their stake.²⁴ Depositors are more numerous and they may be more diversified. Barring liquidity constraints or transactions cost, managers and depositors together should purchase the whole issue for positively valued thrifts. Because the interests of managers and investors are aligned, these predictions also apply to the case where managers have superior information than investors.

B. Perquisite Consumption and Conflicts of Interest between Managers and Investors

The foregoing assumes that the interests of managers and investors are perfectly aligned. This implies that the issue size choice is only affected by variation in growth opportunities. However, in contrast to investors who can benefit from the conversion only by becoming shareholders, managers can benefit in two ways. First, they can acquire shares in the thrift. This portfolio decision depends on the expected underpricing. Second, the issue size choice may affect managers' ability to consume perquisites. If perquisite consumption is positively related to the amount of capital raised at the time of conversion, then managers may have an incentive to increase the issue size excessively, causing after-market price performance to decline.

In a PC case with full information the issue size becomes so large that the thrift's assets are dissipated on unprofitable investment opportunities and managerial perquisite consumption. The maximum issue size is attained at a level where investors just realize the opportunity cost of capital on their investment. Investors, including priority subscribers such as depositors, therefore treat investment in the thrift the same way as an investment in any other asset earning the market rate of return. Hence, in this case there exists no relationship between after-market price performance and the issue size choice. Since the managers are less diversified, their optimal share holdings in the thrift are lower than those of diversified investors. More precisely, in a PC case with full information there is no relationship between the management's or depositors' holdings and after-market price performance.

The second possibility is that there exist asymmetries of information. If investors cannot observe growth opportunities, managers may have an incentive to overstate them, thereby further increasing both the issue size and their consumption of perquisites. Specifically, despite poor investment prospects, managers of poor quality thrifts have an incentive to increase the issue size excessively, causing the return on investment to be lower than

²⁴ Managers are required to hold their stake for a minimum of one year from the conversion date.

the investors' opportunity cost. This incentive creates adverse selection in the market for IPOs of thrift conversions.

Finance theory suggests that when the possibility of adverse selection exists insiders may attempt to signal their firms' value to investors by increasing their holdings of the firm's securities (e.g., Leland and Pyle (1977)). In the case of thrift conversions, the management's ownership stake in the thrift may act as a signal. However, in contrast to the standard models in corporate finance, under the PC hypothesis managers of converting thrifts do not signal to obtain better terms from the market for an issue of fixed size. Rather, they signal to obtain the largest capitalization that permits investors to earn the opportunity cost of capital.

Management's purchase of shares in the thrift reduces the diversification of their portfolios. However, the utility loss caused by reduced diversification is not equal for managers across all thrifts. For a given issue size, the loss is greater for managers of lower quality thrifts because they will earn a lower expected return on their undiversified portfolios.²⁵ Hence, investors can make inferences about the value of growth opportunities by observing management purchases.

In a signalling equilibrium the quality of the thrift's growth opportunities is revealed to depositors and potential investors through the portfolio decisions of managers. As a result, although managers have an incentive to overstate the growth opportunities, they cannot increase the issue size beyond the point at which investors earn an expected return that is equal to their opportunity cost of capital. Thus, as in the full information PC case the return realized by investors is again invariant across thrifts and equals the opportunity cost. However, in contrast to the full information PC case, investors will be conditioning their purchases on the investment decisions of managers. As a result, managers invest in the thrift to reveal its value to investors. The greater the issue size, the greater the management's stake. Depositors have no incentive to vary their holdings with the issue size and the realized rate of return equals the opportunity cost in all cases. Hence, in the PC signalling case there is a positive relationship between the issue size choice and the management's stake in the thrift and no relationship between the holdings of managers and depositors and the realized after-market price performance.

In our empirical tests we use the choice of offer price relative to the appraised value as a measure of the issue size choice. The closer the value of the offer is to the upper limit of the appraisal range, the greater the financial slack created. The distribution of offer prices relative to appraised values in our sample is given in Figure 1. We observe significant variation of offer prices within the range of 85 to 115 percent of appraised value mandated by regulations. We take this as preliminary evidence that our conjectures about the tradeoffs in the issue size choice may have empirical relevance.

²⁵ This implies that the single-crossing property holds with the ownership stake as a signal (e.g., see Cooper (1984)).

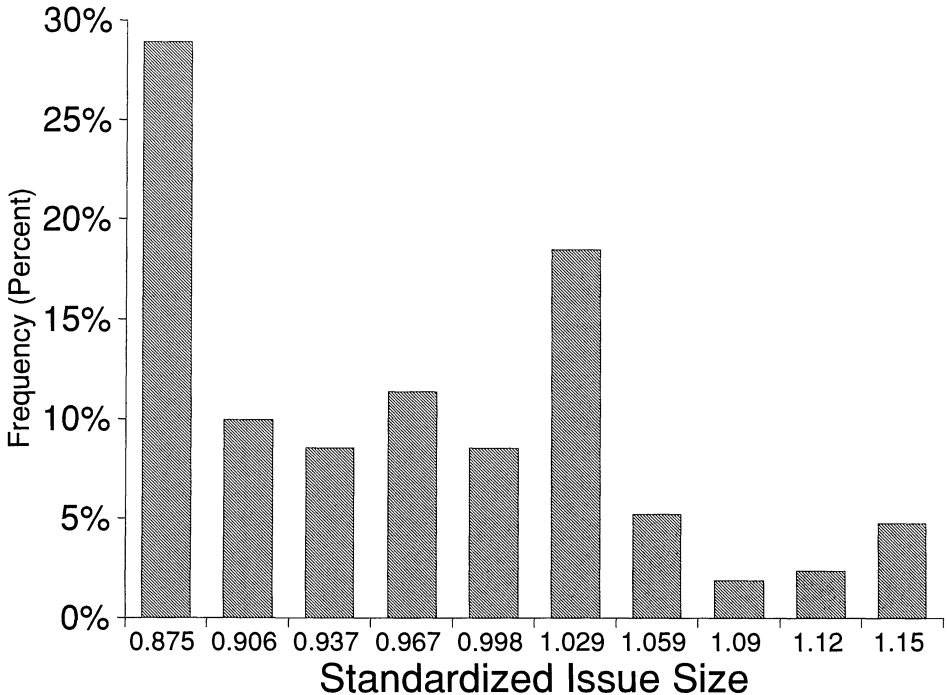


Figure 1. Issue size choice. This figure displays the frequency distribution of the issue size choice variable for our sample of 211 conversions completed during 1980 to 1988. The issue size choice variable, *THETA*, is the offer price divided by the average of the minimum and the maximum value of the converting thrift.

III. Data Sources and Summary Information

A sample of thrift institutions that converted to stock charter between 1980 and 1988 is compiled from Investment Dealers Digest Information Services (IDD), Shearson Lehman Hutton, and SNL Securities Inc., and checked against a list produced by the Associate General Counsel of the FHLBB relating to 704 thrift conversions that were completed over the 1972 to 1988 period. Institutions in the sample are also matched with the Center for Research in Security Prices (CRSP) daily New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) tapes, the CRSP daily NASDAQ tapes, Data Resource Incorporated (DRI) files and the *S & P Stock Record Book*. We identified 278 institutions from CRSP files, 9 institutions from DRI files, and 8 institutions from the *S & P Stock Record Book*. Institutions are deleted from this sample if the first after-market price date is not within seven days of the offer date. A seven-day limit between the offer date and the after-market price is imposed to minimize inconsistencies caused when daily initial returns are computed. These restrictions caused 8 institutions to be eliminated, bringing down our sample size to 287 observations.

The appraised value, the identity of the appraiser, and the following data are obtained directly from offering circulars: the offer date and price, the underwriter, the total number of shares issued, shares offered to the public, the number of shares subscribed by management, and the identity of the deposit guarantor (Federal Deposit Insurance Corporation (FDIC) or FSLIC).²⁶ We cross check previously collected data with those of circulars. In case of discrepancies the numbers reported in the offering circulars are used.

We construct an equally weighted thrift stock price index using CRSP daily NYSE and AMEX and the NASDAQ tapes. Starting with the ten thrifts reported as existing in January 1980 by Kane and Unal (1988), we use returns data for these and for newly converted thrifts to obtain the average daily return from holding an equally weighted thrift portfolio over the period 1980 to 1988. The resulting average daily returns series is then converted to a price index by cumulating the daily compound returns over the sample period.

Weekly yields on ten-year Treasury bonds come from DRI. Rankings of underwriters are taken from Carter and Manaster (1990). They rank 117 underwriters using positions in tombstone announcements using IPOs issued between 1979 and 1983. Assigned ranks range between 0.0 and 9.0, where the most prestigious underwriters are assigned a rank of 9.0.

We check whether or not each of our sample of thrift institutions was still operating at the end of 1988. Twenty FSLIC-insured thrifts had ceased to exist. OTS files show that ten of these institutions had failed and that the remaining ones had merged with other thrifts. Finally, we collect data on seasoned thrift offerings. According to the IDD there were only 77 seasoned offerings totalling \$1.3 billion during the 1981 to 1988 period. Only 11 thrifts in our sample are among these 77.

Table I provides summary information on the total FSLIC-insured conversions as well as on sample conversions. Over our sample period 655 FSLIC-insured mutual thrift institutions converted to stock form, raising \$10.4 billion. Panel B summarizes issue-related information for our sample of FSLIC- and FDIC-insured thrifts. Our sample of 182 FSLIC-insured thrifts represents 28 percent of all FSLIC-insured thrift conversions during 1980 to 1988. In terms of the dollar size of the conversions, these thrifts account for 64 percent of the total amount of stock sold during the same period. Unfortunately, we do not have comparable information regarding the total number of FDIC-insured mutual savings bank conversions, since these are approved at the state level.

Panel C of Table I shows sources of capital in conversions for the subsample of thrifts for which data are available. For our total sample, the capital raised in public offerings provides 60.9 percent of the total funds raised during the sample period. Capital subscribed by depositors provides 35.9

²⁶ We are grateful to Chan-Jane Lin and Jay Ritter for providing us with offering circulars. Additional circulars were obtained from the OTS research library and directly from the institutions.

Table I
Descriptive Statistics for Thrift Institutions That Convert from Mutual Organization to Stock Organization

Panel A reports population characteristics of FSLIC-insured thrift conversions. Panel B lists characteristics for the total sample of FSLIC- and FDIC-insured thrift conversions. Panel C reports sources of capital raised in the sample of FSLIC- and FDIC-insured thrift conversions. Depositor capital is the percentage of gross proceeds contributed by priority subscribers (excluding thrift management). Management capital is the percentage of gross proceeds raised from management. If priority subscribers and management do not purchase the entire offer, then the remainder is offered to the public. Public capital is the proportion of gross proceeds raised in the public offering. Panel D reports price appreciation (underpricing) measured as average initial returns. Initial one- (five-)day returns are calculated as $((P_t - P_0)/P_0) - R_m$, where P_0 is the offer price, P_t is the first day (fifth) day closing price, and R_m is the return for corresponding periods on CRSP NASDAQ composite index. In Panels B and D, the first cell is the mean, the number following in parentheses is the standard deviation, and the number on the line below is the range of the series.

	Year of Conversion									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1980-88
Panel A. Total FSLIC Insured Conversions										
Number of conversions	16	37	31	83	96	78	86	130	98	655
Amount of stock sold (millions \$)	141	127	123	2741	715	1385	2484	1957	767	10438
Panel B. FSLIC and FDIC Insured Conversions										
Number of conversions	4	4	4	52	33	29	74	55	25	280
Average offer price	11.7 (3.5) 7.0 to 14.8	12.0 (1.9) 10.0 to 14.5	11.3 (0.9) 10.0 to 12.0	12.2 (2.7) 9.0 to 20.0	9.6 (1.8) 6.0 to 13.8	11.3 (3.5) 5.0 to 23.0	11.1 (2.6) 5.6 to 17.8	9.3 (2.2) 5.5 to 15.0	8.5 (1.6) 5.8 to 12.0	10.6 (2.8) 5.0 to 23.0
Average gross proceeds (millions \$)	26.5 (14.7) 5.1 to 39.1	13.1 (6.1) 5.5 to 20.1	18.9 (12.0) 6.2 to 29.4	51.9 (75.1) 8.5 to 353.6	20.6 (18.8) 3.7 to 75.6	38.5 (40.8) 4.5 to 159.6	47.3 (49.0) 8.9 to 346.1	32.2 (45.1) 2.5 to 231.1	20.3 (14.8) 2.5 to 53.8	37.5 (49.3) 2.5 to 353.6
Amount of stock sold (millions \$)	105.4	52.2	75.6	2696.7	680.4	1117.0	3502.1	1774.3	506.7	10510.4

Table I—Continued

	Year of Conversion									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1980–88
Panel C. Components of Average Gross Proceeds per Conversion										
Depositor capital (%)	18.6	7.6	35.5	28.2	17.6	28.4	39.4	48.1	54.3	35.9
Management capital (%)	3.0	4.6	6.3	2.3	4.9	3.2	3.2	3.8	6.0	3.2
Public capital (%)	78.3	87.8	58.2	69.5	77.5	68.4	57.4	48.1	39.7	60.9
Panel D. Distribution of Underpricing										
Initial one-day return (%)	–0.3 (3.6)	0.0 (0.2)	16.1 (13.4)	2.5 (5.2)	1.0 (4.5)	12.7 (12.5)	6.6 (11.7)	3.5 (7.6)	4.5 (12.4)	5.0 (9.9)
	3.3 to 4.8	–0.2 to 0.2	3.4 to 35.0	–5.5 to 21.3	–6.8 to 20.9	–3.7 to 37.2	–6.4 to 72.8	–5.1 to 32.6	–3.9 to 59.2	–6.8 to 72.8
Initial five-day return (%)	–1.8 (7.2)	–2.1 (4.0)	24.1 (21.8)	4.3 (7.8)	1.8 (6.3)	15.5 (13.1)	7.9 (11.9)	4.8 (9.4)	5.9 (14.2)	6.4 (11.4)
	–8.6 to 5.5	–7.4 to 2.4	7.0 to 55.4	–8.9 to 25.6	–11.7 to 18.0	–4.6 to 37.6	–8.8 to 63.9	–15.5 to 32.9	–9.4 to 64.5	–15.5 to 64.5
Number of conversions	4	4	4	52	36	30	75	57	25	287

percent, with management contributing 3.2 percent. The amount contributed by depositors increases toward the end of the sample period. The relatively low amount contributed by depositors indicates that the process of conversion does not redistribute property rights back to the depositors. In contrast to standard IPOs, where rationing is an important feature in explaining after-market behavior, in conversions we observe a class of priority investors who do not exercise their rights to acquire equity. If the right to acquire equity is valuable, then these investors forego profit opportunities.²⁷

We measure the realized after-market excess returns (underpricing) U_{it} , as $U_{it} = (((P_{it} - P_{io}) \times 100 / P_{io}) - R_{mt})$, where P_{it} is the after-market closing or bid price for thrift i on day t , P_{io} is the offer price, and R_{mt} is the percentage change in the CRSP NASDAQ daily index between the issue day and day t , inclusive. Equally weighted annual averages of one-day and five-day market-adjusted initial excess returns are shown separately in Table I, Panel D. Inspection of the panel clearly shows that IPOs of thrift conversions show positive after-market price performance (underpricing). Investors received an average of five percent one-day return for offers occurring during the 1980 to 1988 period.²⁸ The range is between -7 and 73 percent. Additionally, monthly averages of one-day initial excess returns are negative in only twelve months and only one of these exceeds 2 percent and two of these exceed 1 percent.²⁹ The initial excess returns exhibit an interesting temporal variation. They peaked during the latter part of 1985 and the first half of 1986. The 44 conversions between May 1985 and June 1986 have an average one-day initial excess return of 15.3 percent.

The average level of observed underpricing is relatively low compared to the conventional IPOs. In the context of our discussion above, the observed level of underpricing suggests that either the value of mutual equity is low in comparison with the appraised value or the market expects the proceeds of the offering to be invested in negative NPV projects, or both. Thus, as equation (1) demonstrates, the low observed underpricing is consistent with a case in which the mutual equity V_0 is small and positive NPV projects are undertaken.³⁰ An alternative case which yields low underpricing is one in which mutual equity has positive value but new projects $PVGO(P_0)$ have zero or negative value, net of value transfers to deposit insurers. In the first case, choice of the issue size closer to the maximum of the appraised range should be associated with higher after-market returns. In the second case issue size closer to the minimum will be associated with higher returns. The empirical tests below examine these conjectures.

²⁷ However, they also avoid the diversifiable risk they would incur if they increased their holdings or if they purchased stock for immediate sale in the after-market.

²⁸ Our findings are consistent with those reported by Jordan, Verbrugge, and Burns (1988) and Masulis (1987) for the 1980 to 1983 period.

²⁹ Monthly averages of one-day returns can be obtained from the authors.

³⁰ This could arise, for example, if mutual thrifts had invested long-term funds at rates that were lower than the current short-term borrowing rates, as discussed in Kane (1989).

IV. The Empirical Model of Thrift Conversions

The empirical model of the issue size choice and underpricing in thrift conversions consists of a triangular system in which the depositors' purchases, the issue size choice, and underpricing are endogenous variables. This is consistent with the sequence of events in conversions. First, following the managers' decision to convert and to invest, the depositors are solicited. Depositors purchase shares at the maximum of the appraisal range. Second, management chooses an issue size, and hence the offer price, within the appraisal range. Shares not already purchased by the depositors and other priority investors are then offered to the public.³¹ This occurs just before the third step, when the issue is brought to the market and after-market price performance is observed.³²

$$DEP_i = \alpha_0 + \alpha_1 MAN_i + \alpha_2 LINT_i + \alpha_3 LIND_i + \epsilon_{1i} \quad (2)$$

$$THETA_i = \beta_0 + \beta_1 MAN_i + \beta_2 DEP_i + \beta_3 DINT_i + \beta_4 DIND_i + \epsilon_{2i} \quad (3)$$

$$U_i = \gamma_0 + \gamma_1 THETA_i + \gamma_2 TSUB_i + \gamma_3 DINT_i + \gamma_4 DIND_i + \epsilon_{3i}. \quad (4)$$

In equations (2) to (4) *DEP* and *MAN* are total values of shares purchased by depositors and the management, respectively, expressed as a percentage of the capital raised, *TSUB* is the total of *DEP* and *MAN*, *LINT*, and *LIND* are the yield on ten-year Treasury bonds and the level of the thrift stock price index at the time of the subscription offering, and *DINT* and *DIND* are proportional changes in the ten-year yield and the thrift index between the subscription and public offering dates. *U_i* is the observed one-day excess return, and *THETA* is an indicator of the issue size choice, measured as the offer price relative to the appraised value.

Summary statistics for the variables are given in Panel A of Table II. Correlations between variables are shown in Panel B. OLS estimates of the model (2) to (4) are given in columns 1 to 3 of Table III for the full sample period 1980 to 1988. To test the robustness of the estimates, Table III also reports estimates for two subsamples, 1980 to 1985 and 1986 to 1988, each containing a roughly equal number of observations. We estimate the cross-sectional regressions, which tend to exhibit heteroscedasticity, using White's (1980) correction for standard errors.³³

³¹ Priority subscribers are given a rebate if the price at which shares are sold to the public is less than the maximum of the appraisal range. Note that as a result priority investors do *not* know the final price of their shares when they make their purchase decisions.

³² By regulation the public offer must occur within 45 days of the offer to priority subscribers.

³³ Since regulations bound *THETA*, column 3 and 4 should, strictly speaking, be estimated using a limited dependent variable estimator that takes into account double censoring at the limits. We estimate equations (2) and (3) using Tobit regression. The results are not altered. For consistency we report the OLS estimates. We also verify that *THETA* is exogenous in equation (4) using the Hausman (1978) specification test.

Table II
Summary Statistics of Regression Variables

U is calculated as $((P_t - P_0)/P_0) - R_m$, where P_t is the closing bid price on the first day of trading, P_0 is the offer price, and R_m is the return for corresponding periods on CRSP NASDAQ composite index. $THETA$ is calculated for each converting thrift as the offer price divided by the average of the minimum and maximum value of the appraised value of the converting thrift. MAN and DEP are percentages of shares purchased by the management and priority subscribers (excluding management). $TSUB$ is the sum of MAN and DEP . CAP is the issue proceeds. PRR is the reciprocal of the offer price. $RANK$ is the rank assigned to the underwriter by Carter and Manaster (1990). $SIGMA$ is the standard deviation of returns during the first 30 days following the conversion. $LIND$ is the thrift stock price index lagged six weeks from the date of the public offer and $DIND$ is the proportional change in the index over the six weeks prior to the public offer. $LINT$ is the rate on ten-year Treasury bonds lagged six weeks from the date of the public offer and $DINT$ is the proportional change of the ten-year rate on Treasury bonds over the six weeks prior to the public offer.

Panel A: Means						
	N	Mean	Std. Deviation	Minimum	Maximum	
U	287	0.0496	0.0989	-0.0678	0.7284	
$THETA$	211	0.9471	0.0814	0.85	1.15	
MAN	281	0.0584	0.0526	0.0004	0.3662	
DEP	279	0.3562	0.2452	0.0249	0.9898	
$TSUB$	279	0.4145	0.2610	0.0353	1.00	
CAP	280	\$37.5m	\$49.3m	\$2.4m	\$353.6m	
PRR	287	0.1012	0.0264	0.0435	0.20	
$RANK$	271	6.8764	2.2825	1.5	9.0	
$SIGMA$	287	0.0203	0.009	0.0035	0.0689	
$LIND$	287	4.223	1.900	0.721	6.940	
$DIND$	287	0.038	0.097	-0.106	0.660	
$LINT$	287	0.0954	0.0197	0.0698	0.1544	
$DINT$	287	0.0003	0.062	-0.1972	0.2136	

Panel B: Covariance Matrix													
U	$THETA$	MAN	DEP	$TSUB$	CAP	PRR	$RANK$	$SIGMA$	$LIND$	$DIND$	$LINT$	$DINT$	
U	1												
$THETA$	0.50	1											
MAN	0.05	-0.05	1										
DEP	0.39	0.36	0.20	1									
$TSUB$	0.38	0.33	0.39	0.98	1								
CAP	-0.02	0.12	-0.37	-0.01	-0.09	1							
PRR	-0.20	-0.32	0.32	-0.11	-0.03	-0.32	1						
$RANK$	-0.10	-0.07	-0.47	-0.17	-0.26	0.31	-0.27	1					
$SIGMA$	0.15	0.11	-0.13	0.07	0.04	0.11	0.07	0.15	1				
$LIND$	0.05	-0.04	0.10	0.45	0.44	0.02	0.23	-0.22	0.05	1			
$DIND$	0.25	0.22	-0.08	-0.10	-0.11	0.06	-0.13	0.15	0.17	-0.35	1		
$LINT$	-0.10	-0.05	-0.40	-0.40	-0.37	-0.08	-0.08	0.16	-0.13	-0.83	-0.35	1	
$DINT$	-0.20	-0.12	0.09	0.09	0.09	-0.12	0.09	-0.08	-0.00	0.23	-0.49	-0.12	1

A. Depositor Purchases

Depositor purchase decisions during the subscription period are modelled in equation (2). Depositors use information about the management’s purchases (*MAN*) in making their subscription decisions (*DEP*). We also allow depositors’ investment decisions to be affected by market conditions at the time they subscribe. These conditions are proxied by *LINT* and *LIND*.

The relationship is positive for the AI case where there are no conflicts of interest between managers and investors concerning the issue size choice. In the PC case, however, since underpricing is driven to zero, depositors treat this investment opportunity the same as any other investment opportunity. Hence, managerial purchases should have no material effect on depositors’ portfolio decisions.

Our specification can explain 22 percent of the variation in depositors’ purchases. Consistent with the AI case, column 1 of Table III shows that there is a positive and significant relationship between the managers’ and depositors’ participation in the offering. Additionally, depositor participation is greater when the thrift stock-price index is high. Thus, depositors’ purchases are correlated with the value of converted thrifts. However, the long-term interest rate is not significant.³⁴

B. Issue Size Choice

The determinants of the issue size choice are modelled in equation (3). Our indicator of the issue size choice is *THETA*, defined as the ratio of the offer price divided by the mid value of the appraisal range.³⁵ In addition to *MAN* and *DEP*, equation (3) also allows for changes in the general market conditions during the conversion process to affect the issue size choice. Because a period of up to six weeks elapses between the time at which priority subscribers first purchase shares and the time of the IPO, the terms of the public offering should be adjusted to reflect the arrival of new information during this interval. To model changes in the thrift’s value during this period, we introduce two information variables: changes in the thrift index, *DIND*, which reflect investors’ expectations of economic prospects, and changes in the long-term interest rate, *DINT*. *DIND* and *DINT* are proxied by the percentage changes in the thrift index during the six weeks prior to

³⁴ When, as a specification check, we replace the thrift index with the S & P 500 Index we do obtain significance for the long-term interest rate. However, the S & P 500 Index also loses significance when the thrift index is included in the specification. This suggests that in equation (2) the thrift index captures both the effects of the market and interest rates on thrift valuation.

³⁵ Thus, we take the appraised value as an estimate of the valuation of the equity and growth opportunities of the thrift by an investor without access to inside information. Note that our analysis does not require that the appraisal be unbiased. Since the overwhelming majority of appraisals were conducted by Kaplan and Smith we believe that they are consistent across observations. In a sample of IPOs Weiss (1990) finds a strong positive relationship between a variable measuring the ratio of the issue size to the initial proposed amount of the issue. This variable differs from *THETA* in that the initial proposed issue size is a choice variable of the firm and its value may be chosen strategically by the firm.

Table III
Analysis of the Issue Size Choice and Underpricing in Thrift Conversions

$$\begin{aligned}
 DEP_i &= \alpha_0 + \alpha_1 MAN_i + \alpha_2 LIND_i + \alpha_3 LINT_i + \epsilon_{1i} \\
 THETA_i &= \beta_0 + \beta_1 MAN_i + \beta_2 DEP_i + \beta_3 DINT_i + \beta_4 DIND_i + \epsilon_{2i} \\
 U_i &= \gamma_0 + \gamma_1 THETA_i + \gamma_2 TSUB_i + \gamma_3 DINT_i + \gamma_4 DIND_i \\
 &\quad + \sum_{t=0}^5 \gamma_{5+t} D_{1982+t} + \epsilon_{3i}
 \end{aligned}$$

U is calculated as $((P_t - P_0)/P_0) - R_m$, where P_t is the closing bid price on the first day of trading, P_0 is the offer price, and R_m is the return for corresponding periods on CRSP NASDAQ composite index. $THETA$ is calculated as the offer price divided by the average of the minimum and maximum appraised value of the converting thrift i . MAN and DEP are the percentages of the offer purchased by the management and priority subscribers (excluding management) respectively. $TSUB$ is the sum of MAN and DEP . $LIND$ is the thrift stock price index lagged six weeks from the date of the public offer. $DIND$ and $DINT$ are proportional changes of the ten-year rate on Treasury bonds and the industry index over the six weeks prior to the public offer, respectively. $LINT$ is the weekly rate on ten-year rate on Treasury bonds lagged six weeks from the date of the public offer. D8082 is a dummy for the period before the conversion restrictions were fully repealed (1980–1982). The remaining D83 to D87 are annual time dummies.

	Full Period: 1980–1988					Subperiod: 1980–1985		Subperiod: 1986–1988	
	DEP (1)	THETA (2)	U (3)	U (4)	U (5)	U (6)	U (7)	U (8)	U (9)
Constant	0.192 (0.9)	0.898** (83.6)	-0.442** (-7.4)	-0.361** (-6.3)	-0.358** (-6.1)	-0.433** (-5.0)	-0.342** (-4.5)	-0.445** (-5.3)	-0.377** (-4.4)
THETA	—		0.499** (7.4)	0.385** (5.8)	0.336** (5.2)	0.486** (5.0)	0.343** (4.0)	0.509** (5.4)	0.413** (4.1)
DEP	—	0.153** (6.2)	—	—	—	—	—	—	—
MAN	0.776** (2.6)	-0.175 (-1.8)	0.256** (3.4)	—	—	0.304** (2.6)	—	0.156 (1.5)	—

Table III—Continued

	DEP (1)	THETA (2)	Full Period: 1980–1988					Subperiod: 1980–1985		Subperiod: 1986–1988	
			U	U	U	U	U	U	U	U	U
			(3)	(4)	(5)	(6)	(7)	(8)	(9)		
TSUB	—	—	—	0.101** (4.4)	0.120** (4.6)	—	0.207** (4.6)	—	0.063* (2.1)		
DINT	—	0.018 (0.2)	-0.348** (-3.2)	-0.330** (-3.1)	-0.298** (-3.4)	-0.464* (-2.2)	-0.437** (-2.5)	-0.260* (-2.1)	-0.252* (-2.1)		
DIND	—	0.205** (3.6)	0.027 (0.3)	0.069 (0.9)	—	0.008 (0.2)	0.032 (0.3)	0.040 (0.4)	0.042 (0.4)		
LIND	0.048* (2.9)	—	—	—	—	—	—	—	—		
LINT	-0.883 (-0.6)	—	—	—	—	—	—	—	—		
D8082	—	—	—	—	0.042 (1.2)	—	—	—	—		
D83	—	—	—	—	0.032* (2.1)	—	—	—	—		
D84	—	—	—	—	0.045** (2.8)	—	—	—	—		
D85	—	—	—	—	0.097** (4.0)	—	—	—	—		
D86	—	—	—	—	0.032* (2.2)	—	—	—	—		
D87	—	—	—	—	0.032 (1.9)	—	—	—	—		
Adj. R ²	0.22	0.20	0.36	0.36	0.41	0.30	0.42	0.32	0.35		
DF	275	205	205	205	200	103	103	98	97		
F-value	27.4	13.7	30.3	30.7	17.67	12.6	20.4	13.3	14.3		

** Significant at 1 percent.

* Significant at 5 percent.

the public offering, and the weekly yield on ten-year Treasury bonds, respectively.³⁶

In the AI case there is a positive relationship between holdings by managers and depositors and *THETA*. By contrast, in the PC case with full information we observe no relationship between *THETA* and the proportion of the issue bought by either depositors or management. However, if asymmetries of information exist and managers use their personal holdings as a dissipative signal, then in the PC case a positive correlation between managerial holdings and issue size choice, *THETA*, should be observed.

As shown by the estimates of equation (3) in column 2 of Table III, in our sample the issue size is larger (i.e., the offer price is set closer to the maximum of the appraised range) the greater the depositor subscriptions. This finding is consistent with the AI case in which depositors' purchases are larger in thrifts with valuable growth opportunities. *MAN* is negative and not significant in the issue size equation. Thus, there is no evidence that managers use their holdings as a signal of higher quality and better growth opportunities. Finally, while improvements in the industry conditions lead to greater issue size choice, changes in interest rates do not have a similar effect.

To provide a direct check of the conjecture that managerial incentives and the desire to exploit future growth opportunities are important determinants of the issue size, we regress the growth rate of assets in two years following the conversion, *GRO*, on the issue size choice, *THETA*, and managerial stock options as a proportion of total stock holdings, *OPT*. We obtain the following (*t*-values are in parentheses):

$$\begin{aligned}
 GRO = & -0.618 + 0.965^{**}THETA + 1.635^{**}OPT \\
 & (-1.9) \qquad (2.9) \qquad (2.5) \\
 Adj.R^2 = & 0.15 \quad DF = 76 \quad F\text{-value} = 7.7
 \end{aligned}$$

As suggested by our model, both the issue size choice, *THETA*, and managerial incentives, *OPT*, are significant in explaining future growth.³⁷

C. Underpricing

Equation (4) tests the predicted relationship between underpricing and the issue size choice, *THETA*, and management's percentage purchases of the offering, *MAN*. According to equation (1) underpricing reflects the value of the thrift's mutual equity and growth opportunities to be exploited with the issue proceeds. In the AI case, there is a positive relationship between the underpricing, the holdings of managers, *MAN*, and the issue size choice. In the PC case there is no relationship between these variables. We

³⁶ The results remain qualitatively unchanged when the thrift index is replaced with the S & P 500 Index. However, the specification with the thrift index yields slightly higher R^2 values.

³⁷ We reestimate this equation with *MAN* as an additional explanatory variable. However, it is not significant.

also include *DINT* and *DIND* in the underpricing equation. These variables proxy for changes in the value of the thrift during the subscription period. This allows us to examine how new information is incorporated into the pricing of the issue.

Table III shows that our specification of the underpricing equation explains a significant degree of variation. The adjusted R^2 of 0.36 and the F -value of 30.3 are significant at the 1 percent level. The significant and positive relationship between underpricing and *THETA* suggests that, as predicted in the AI case, an increase in the issue size choice is associated with larger gains by investors. Additional evidence for the AI case comes from the fact that increased management participation in the offer, *MAN*, is significantly associated with greater underpricing.

The positive relationship between underpricing and the issue size choice indicates that the market rewards thrifts which raise additional capital. This finding is consistent with the hypothesis that thrifts with greater positive growth opportunities raise more capital for expansion and have correspondingly better after-market price performance. Together with the observation that average underpricing is around 5 percent during the same period, it suggests that for our sample of thrifts the average value of mutual equity prior to conversion is quite small.

There are two potential problems with our specification of the underpricing equation in column (3). First, if the number of managers and their total wealth vary with the size of the thrift, then *MAN* may not be a satisfactory proxy for the managerial variables suggested by the model.³⁸ Because total subscriptions by priority investors may proxy for insider holdings in the AI case, we reestimate the underpricing equation with *TSUB* replacing *MAN* in column 4. The advantage of this specification is that the wealth of depositors is likely to be proportional to the size of the thrift, so that *TSUB* is not affected by wealth constraints. The new specification reported in column 4 improves the fit somewhat but does not change the qualitative results and is also consistent with the AI case. The observation that underpricing is positively related to the proportion subscribed but that not all depositors participate suggests that there is significant heterogeneity among the depositors.

The second potential problem with *MAN* is that the purchase of shares is only one form of managerial participation. Managers may also receive stock options that may confound the relationship between *MAN* and underpricing. To control for such misspecification we reestimate equations (3) and (4) with an additional variable, the ratio of the number of stock options granted to

³⁸ We try several alternative specifications that standardize managerial purchases for thrift size without qualitatively affecting the results. For example, since *MAN* declines rapidly with asset size, we regress the natural logarithm of *MAN* on a polynomial of the total assets and use the resulting error in the estimate of *MAN*, standardized by its predicted value, as a measure of managerial holdings. Although the polynomial explains approximately half the variation in *MAN*, the constructed variable is highly correlated with *MAN* and does not alter our conclusions. Also, the use of the dollar value of managerial purchases in place of proportional purchases does not materially alter our results.

insiders to the total number of shares issued, *OPT*. The results remain unchanged and *OPT* is not significant.³⁹

The estimates of the underpricing equation in columns 3 and 4 show that during the conversion process an increase in the thrift index does not lead to higher underpricing whereas a reduction in the long-term interest rate does.⁴⁰ This is consistent with column 2, which reveals that an increase in the thrift index during the subscription period is significantly related to an increase in the issue size, whereas a reduction in the long-term interest rate, which increases the value of the mutual equity, does not have an effect on the issue size choice.

Column 5 augments the model in column 4 with time dummies. D8082 is a dummy for the period before the conversion moratorium was fully repealed (1980 to 1982). The remaining D83–D87 annual dummies control for changes in the macroeconomic environment not captured by our model variables. Again, the results remain unaffected. Finally, columns 6 to 9 report results for the two subperiods. As in the full sample results, *TSUB* proves to be a better proxy for insider holdings than *MAN*. In general, the model proves to be robust with respect to subperiods.

To provide further evidence that underpricing is positively related to the value of the thrift we investigate the relationship between the observed underpricing, U_i measured as in equation (4), and earnings subsequent to conversion. Following Dann, Masulis, and Mayers (1991) we regress underpricing on reported earnings, scaled by assets, $(E_i/A_i)_t$, $t = 1, 2, 3$, in the three years following a conversion. The result is as follows (t -values are in parentheses):

$$\begin{array}{ccccccc}
 U_i = 0.036^{**} + 0.047^{**}(E_i/A_i)_1 - 0.010(E_i/A_i)_2 - 0.002(E_i/A_i)_3 & & & & & & \\
 (3.8) & (2.3) & (-1.2) & & & (-0.8) & \\
 \text{Adj. } R^2 = 0.07 & \text{DF} = 91 & F\text{-value} = 3.2 & & & &
 \end{array}$$

Consistent with our framework, thrifts with large amounts of underpricing reported higher earnings within the first year of conversion to a stock thrift.

V. Underpricing in Conversions and the IPO Literature

In this section we compare the explanatory power of variables identified in the IPO literature as conveying information to investors with the variables suggested by our framework. Since the predicted correlations between underpricing and the IPO variables differ in the AI and PC cases, this also provides an additional test of whether or not the interests of managers and investors are aligned.

³⁹ We also measure management share holdings on a fully diluted basis (management shares as a percentage of total shares issued plus total number of stock options). The results remain unchanged.

⁴⁰ Flannery and James (1984) and Kane and Unal (1988, 1990) report a negative relationship between interest rates and stock prices of financial institutions.

Among the variables that are identified in the IPO literature as explaining the cross-sectional variation in underpricing are the standard deviation of stock returns (e.g., Ritter (1984)), the gross proceeds raised in an offering (e.g., Beatty and Ritter (1986) and Tinic (1988)), the offer price (e.g., Tinic (1988)), and quality of the underwriter (Tinic (1988) and Carter and Manaster (1990)). The IPO literature suggests that, with the exception of the standard deviation of stock returns, high levels of these variables are associated with decreases in informational asymmetries between the firm and potential investors. As a result, the literature predicts underpricing to be negatively related with these variables.

These explanations of underpricing in IPOs have received empirical support. Both Tinic (1988) and Carter and Manaster (1990) provide evidence consistent with the conjecture that issues underwritten by more prestigious firms are less underpriced. Beatty and Ritter (1986) do find issue size to be significant and negatively related to underpricing. Ritter (1984) provides evidence that after-market stock volatility is associated with greater underpricing.⁴¹

The inclusion of the offer price may also be justified on additional grounds. Brennan and Copeland (1988) show in their analysis of stock splits that the price per share can be a signal of the firm's value. Transposing Brennan and Copeland's arguments to conversions, if offer price is a signal of value there would be a significant negative relationship between the offer price and underpricing.

In the AI case conflicts of interest between insiders and investors are not significant. Thus, there is limited gain to investing in dissipative signals or employing underwriters to validate disclosures by managers. In this situation correlations between IPO variables and after-market price performance cannot be explained by signalling or other strategic considerations. However, even in that case there may exist a statistically significant relationship between IPO variables and underpricing. This occurs because in equilibrium the value of the thrift is reflected in underpricing and, as a result, any variable correlated with the value of the thrift is also correlated with underpricing. Thus, if the value of the thrift and the IPO variables are correlated, there may exist a relationship between these variables and underpricing. However, in this equilibrium these variables are not determined strategically, as suggested in the IPO literature. As a result, these factors should not *necessarily* add to the explanatory power of the variables identified in our empirical model. By contrast, in the PC case managers may have an incentive to act strategically to resolve asymmetries of information. However, since in that equilibrium the value of the thrift does not determine underpricing, we do not expect to observe a link between IPO variables and after-market price performance.

⁴¹ However, Tinic (1988) does not find that issue size and low offer price are negatively correlated with underpricing.

Following the IPO literature, we expand (4) as follows:⁴²

$$U_i = \gamma_0 + \gamma_1 THETA_i + \gamma_2 TSUB_i + \gamma_3 DINT_i + \gamma_4 LOGCAP_i + \gamma_5 SIGMA_i + \gamma_6 RANK_i + \gamma_7 PRR_i + \epsilon_{4i}, \quad (5)$$

where *SIGMA*, *PRR*, and *LOGCAP* are the standard deviation of daily returns for 30 days after the offer date, the reciprocal of the offer price, and the logarithm of the dollar amount of the offering, respectively. The index of the quality of the underwriter, *RANK*, is obtained from Carter and Manaster (1990).⁴³

Column 1 of Table IV shows the relationship between U_i and the variables in the IPO information set, excluding the “issue size” or “subscription” information set. With the exception of *LOGCAP*, all are significant. We interpret this finding as evidence that, consistent with the AI case, the IPO variables are proxying for the value of the converting thrift.

We also observe that the offer price, controlling for firm size, is positively related to underpricing and is significant. This contradicts the conjecture that low-priced stocks are associated with speculative firms and the conjecture that a low offer price for the stock acts as a dissipative signal of firm value.⁴⁴ Importantly, the $\bar{R}^2$ for this equation is 0.11. As a result, an investor who only relies on this information set is less able to explain underpricing than an investor who relies on the publicly observable variables suggested by the model in Table III.⁴⁵

The observation that the standard deviation of stock returns after the offering is positively related to the degree of underpricing may reflect two effects. First, as suggested by Rock (1986), ex ante risk may be positively correlated with underpricing and, as Ritter (1984) argues, *SIGMA* may proxy this risk. Second, it may also be a proxy for the value of the deposit insurance subsidy, which is greater the higher the variance of the underlying assets.

⁴² Since *DIND* does not prove to be significant, we exclude this variable from the following specification.

⁴³ Because it is likely that large offers are more efficiently sold by large underwriters and because there is a correlation between firm size and the offer price, we also estimate the model after transforming *PRR* and *RANK* to control for the dollar value of the issue. We separately regress *PRR* and *RANK* on the natural logarithm of *CAP* (*LOGCAP*) and use the residuals of these regressions, *RESPRR* and *RESRANK*, together with *LOGCAP* as explanatory variables. This allows us to examine the marginal effect of the underwriter's rank and offer price, holding size constant. The results reported below remain unchanged when this procedure is used.

⁴⁴ We also try including a dummy variable to identify those thrifts that have made seasoned offerings within two years of the initial offering. If, as suggested in recent papers by Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989), underpricing in IPOs enables the firm to obtain better terms in subsequent secondary offering, then we expect these thrifts to exhibit greater underpricing. The dummy variable is not significant. Similarly, attempts to relate issue size choice *THETA* to differences in access to financial markets, as measured by the dollar value of the offering, do not produce significant results.

⁴⁵ Note that the sample size in the estimation of column 1 in Table IV is greater than that for the underpricing equation in Table III. Comparably restricting the sample in column 1 of Table V does not alter the findings.

The "issue size information set" is added in column 2. Inspection of the column reveals that with the exception of *SIGMA* the IPO variables lose significance. The variables *THETA* and *TSUB* maintain their significance. The $\bar{R}^2$ of 0.45 indicates that this specification provides a substantial improvement over specifications not employing the variables suggested by the model of the issue size choice. This is also true for column 3, where *MAN* is substituted for *TSUB*. However, *MAN* is not significant.⁴⁶ Columns 4 to 7 present results for the subperiods. Again, by themselves the IPO variables are significant in the subperiods but are dominated by our model variables for the full sample. Further, in unreported regressions we find no evidence that IPO variables affect the depositors' purchase decision (equation (2)).

In sum, the significance of the issue size choice variables in the underpricing equation, and the insignificance of insider holdings on the issue size choice, suggest that the public offering in thrift conversions is consistent with the AI case. The observation that the IPO variables lose significance when combined with other publicly observed decision variables suggests that the choice of underwriter and the offer price are not dissipative signals of the value of the thrift. While correlations between the IPO variables and underpricing imply that the selection of an underwriter or an offer price is not arbitrary, it may occur for reasons not directly related to information transmission to investors.⁴⁷ As a consequence, the role of the IPO variables in thrift conversions may be different than would have been predicted by the literature on IPOs.

The behavior of the IPO variables has wider implications. It suggests that dissipative signalling models, and more generally, asymmetric information models, should be tested against specified alternative models which use information already in the marketplace. A significant relationship between a hypothesized signal and an announcement effect does not constitute strong evidence in support of the signalling hypothesis if existing publicly available variables contain the same information as the signal.

As an additional specification check on the underpricing equation, we augment the explanatory variables with an estimate of the value of the mutual equity, the ratio of tangible net worth to total assets in the quarter prior to conversion (*TNW*).⁴⁸ The estimated equation is as follows (*t*-values

⁴⁶ *MAN* is significant only when transformed to take into account firm size, as described in footnote 38. This supports our previous observation that care must be given to the correlation of firm size and management ownership.

⁴⁷ Table II shows that the rank of the underwriter is negatively correlated with the proportion of the issue subscribed by depositors. This suggests that underwriters are not selected on their role in signalling value to uninformed depositors. Interestingly, Table IV shows that rank is negatively correlated with the issue size.

⁴⁸ *TNW* is the book value of equity calculated according to Generally Accepted Accounting Principles less goodwill. Data were obtained from the OTS.

Table IV
Further Analysis of the Underpricing in Thrift Conversions

$$\begin{aligned}
 U_i = & \alpha_0 + \alpha_1 THETA_i + \alpha_2 TSUB_i + \alpha_3 DINT_i \\
 & + \alpha_4 SIGMA_i + \alpha_5 LOGCAP_i + \alpha_6 RANK_i + \alpha_7 PRR_i \\
 & + \sum_{t=0}^5 \alpha_{7+t} D_{1982+t} + \epsilon_{4i}
 \end{aligned}$$

U is calculated as $((P_t - P_0)/P_0) - R_m$, where P_t is the closing bid price on the first day of trading, P_0 is the offer price, and R_m is the return for corresponding periods on CRSP NASDAQ composite index. $THETA$ is calculated as the offer price divided by the average of the minimum and maximum appraised value of the converting thrift i . $TSUB$ is the percentage of the offer purchased by the management (MAN) and other priority subscribers. $DINT$ is the proportional change in the ten-year rate on Treasury bonds between the date of the subscription and the date of the public offering. $LOGCAP$ is the logarithm of the value of the total issue proceeds. $SIGMA$ is the standard deviation of returns during the first 30 days following the conversion. $RANK$ is the rank assigned to the underwriter by Carter and Manaster (1990). PRR is the reciprocal of the offer price. $D8082$ is a dummy for the period before the conversion restrictions were fully repealed (1980–1982). The remaining $D83$ to $D87$ are annual time dummies.

	Full Period: 1980–1988			Subperiod: 1980–1985		Subperiod: 1986–1988	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	0.281* (2.9)	−0.121 (−0.9)	−0.140 (−1.0)	0.337** (2.4)	−0.056 (−0.3)	0.249 (1.8)	−0.235 (−1.3)
<i>THETA</i>	—	0.297** (4.4)	0.406** (5.9)	—	0.29** (3.3)	—	0.367** (3.6)
<i>TSUB</i>	—	0.114** (4.2)	—	—	0.204** (4.2)	—	0.066* (2.2)
<i>MAN</i>	—	—	0.199 (1.6)	—	—	—	—
<i>DINT</i>	—	−.325** (−3.6)	−0.299** (−3.2)	—	−0.450** (−3.1)	—	−0.324** (−2.6)
<i>LOGCAP</i>	−0.007 (−1.3)	−0.01 (−1.6)	−0.010 (−1.5)	−0.01 (−1.3)	−0.012 (−1.3)	−0.005 (−0.7)	−0.004 (−0.5)
<i>SIGMA</i>	2.062** (3.9)	1.982** (3.3)	2.086** (3.3)	3.522** (3.0)	1.766* (1.9)	1.445* (2.2)	1.586* (1.9)
<i>RANK</i>	−0.007** (−2.9)	−0.005 (−1.9)	−0.005 (−1.7)	−0.013* (−2.0)	−0.004 (−0.8)	−0.006* (−2.0)	−0.005 (−1.7)
<i>PRR</i>	−1.049** (−5.6)	−0.349 (−1.7)	−0.518* (−2.5)	−0.933** (−2.6)	−0.405 (−1.2)	−1.033** (−4.3)	−0.294 (−1.5)

are in parentheses):

$$\begin{aligned}
 U_i = & -0.272 + 0.340**THETA + 0.087**TSUB - 0.242DINT* \\
 & (-2.2) \quad (4.8) \quad (3.1) \quad (-2.0) \\
 & -0.006LOGCAP + 2.174SIGMA** - 0.001RANK + 0.114PRR + 0.356TNW** \\
 & (-0.8) \quad (3.2) \quad (-0.3) \quad (0.5) \quad (3.2) \\
 & \text{Adj. } R^2 = 0.40 \quad \text{DF} = 124 \quad F\text{-value} = 12.1
 \end{aligned}$$

Table IV—Continued

	Full Period: 1980–1988			Subperiod: 1980–1985		Subperiod: 1986–1988	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D8082	—	0.025 (0.7)	–0.03 (–0.8)	—	—	—	—
D83	—	0.028 (1.5)	–0.017 (–1.1)	—	—	—	—
D84	—	0.048* (2.5)	0.009 (0.5)	—	—	—	—
D85	—	0.097** (3.7)	0.063* (2.5)	—	—	—	—
D86	—	0.028 (1.6)	0.01 (0.6)	—	—	—	—
D87	—	0.027 (1.4)	0.005 (0.3)	—	—	—	—
Adj. R^2	0.11	0.45	0.40	0.11	0.43	0.10	0.38
DF	259	190	191	117	98	137	90
F-value	9.0	13.7	11.4	4.9	12.5	5.1	9.5

* Significant at 5 percent.

** Significant at 1 percent.

The coefficient of *TNW* is significant and positive, indicating that underpricing is positively related with this indicator of value. *THETA* and *TSUB* retain their significance, showing that they reflect information not contained in the accounting estimate of net worth.

VI. Unconditional Estimates of the Empirical Model of Underpricing

In the AI case predicted relationships between variables are not contingent on the existence of asymmetries of information between managers and investors. As a result, it is not possible to directly distinguish between the situation in which investors can infer all the relevant proprietary information by observing the issue size choice and managerial purchases and the situation in which they cannot. However, in setting prices, the market uses publicly available information differently in the two situations. It is therefore possible to distinguish the situations empirically by specifying a statistical estimator that explicitly models the market's inferences in determining underpricing.

If the management's decision to convert is based in part on proprietary information, then the coefficient estimates of the underpricing equation obtained above may be subject to sample selection bias. The bias occurs because in determining the stock price, the market attempts to infer proprietary information from the publicly observed information, together with the managers' decision to proceed with the conversion and its knowledge of their incentives. The decision to proceed with a conversion conveys little informa-

tion about proprietary information if publicly available information suggests that the growth opportunities are very favorable. By contrast, if the publicly available information is negative, then the decision to proceed implies that the privately observed information is favorable. As discussed by Acharya (1988), Lanen and Thompson (1988), and Eckbo, Maksimovic, and Williams (1990), a systematic relationship between publicly observed variables and inferences drawn by the market biases OLS estimates of equation (4). In this section we reestimate equation (4), taking into account management's incentives to use private information in determining whether to proceed.

If the incentives of managers and investors are aligned, a thrift converts when the managers' proprietary information, combined with publicly available information, indicates that the converted thrift will earn at least a normal rate of return on invested capital for the optimal issue size. Following Eckbo, Maksimovic, and Williams (1990), we model the management's decision criterion as a linear function of publicly available and proprietary information. The managers' proprietary information is η_i and is assumed to be normally distributed with mean zero and variance σ_η^2 . Conversion occurs if

$$\rho_i = E[\rho_i|\Omega] + \eta_i > 0, \quad (6)$$

where $E[\rho_i|\Omega] = x_i\gamma$ is the underpricing predicted using publicly available information Ω and is given in equation (4). Given the publicly observable variables x_i and the incentives of the managers to convert only if they expect excess after-market returns are positive, investors estimate expected abnormal returns (i.e., expected underpricing) as

$$E[\rho_i|\text{conversion initiated}] \equiv E[x_i\gamma + \eta_i|\eta_i > -x_i\gamma] \quad (7)$$

$$= x_i\gamma + E[\eta_i|\eta_i > -x_i\gamma] \quad (8)$$

$$= x\gamma + \sigma_\eta \frac{n(x_i\gamma/\sigma_\eta)}{N(x_i\gamma/\sigma_\eta)}, \quad (9)$$

where $n(\cdot)$ and $N(\cdot)$ are the standard normal density and distribution functions, respectively. Observed underpricing is then given by

$$U_i = x_i\gamma + \sigma_\eta \frac{n(x_i\gamma/\sigma_\eta)}{N(x_i\gamma/\sigma_\eta)} + \epsilon_i, \quad (10)$$

where $\epsilon_i \sim N(0, \sigma_\epsilon^2)$ is a term introduced to model random variation in market conditions on the day of the public issue.

Equation (9) is nonlinear and is estimated using maximum likelihood. The log-likelihood function is

$$\log L = -\frac{n}{2}\log(\sigma_\epsilon^2) - \sum_{i=1}^n \frac{\left[U_i - \left(x_i\gamma + \sigma_\eta \frac{n(x_i\gamma/\sigma_\eta)}{N(x_i\gamma/\sigma_\eta)} \right) \right]^2}{\sigma_\epsilon^2}, \quad (11)$$

for all firms $i = 1, \dots, n$. In the numerical optimizations, the parameter estimates from a cross-sectional OLS regression of U_i on x_i are used as initial values. The regression standard error from the OLS estimation is used as the initial value for the parameter σ_η . The values of the cumulative normal are approximated by the Moran approximation. The likelihood function (10) is maximized using the GRADX, a quadratic hill-climbing routine from Princeton University's GQOPT optimization package.

This specification yields a test of the existence of asymmetries of information between investors and insiders. If the firm's insiders do not possess material proprietary information, then the OLS estimates of (4) and the maximum likelihood estimates of (10) should be identical and there should be no differences in the explanatory power. By contrast, if asymmetries are significant, the two estimates should differ. Thus, a comparison of the fits and estimates obtained in (4) and (10) provides a joint test of the hypothesis that asymmetries of information do not exist and that equation (6) describes the decision criterion of the firm's insiders.

Table V reports that in all specifications the nonlinear model results in increases in the log-likelihood function that are significant at the 5 percent level, as measured by the log-likelihood ratio test. Thus, the nonlinear specification that allows for investors' inferences about proprietary information provides a better statistical model of the underpricing. As required by the analysis of managerial incentives, the estimates of the standard deviation of proprietary information, σ_η , are both positive and significant in all equations.

Inspection of columns 1 and 2 reveals that the estimates of the issue size choice variables are qualitatively similar to those reported in Table III. When the model is augmented with IPO variables in column 3 *LOGCAP* and *SIGMA* prove to be significant. However, when we compare the likelihood function value in columns 2 and 3 we observe no significant improvement. The only additional variable that is significant is *LOGCAP*. Once again we see that IPO variables do not add to the explanatory power of the issue size choice variables.

Taken together, the results reported in Table V are consistent with the hypothesis that managers possess information that potential investors do not. Investors use observed managerial holdings and the issue size choice to make inferences about the proprietary information. There is no evidence that the reputation of the underwriter, or the offer price are independently used to make inferences. These findings support the proposition that the interests of managers and investors are aligned and that the underwriter's rank and offer price are not dissipative signals.

VII. Conclusion

This paper analyzes the after-market price performance of mutual-to-stock conversions in the period 1980 to 1988. We observe that during this period

Table V
Analysis of Underpricing with Correction
for Market Inferences

$$U_i = x\gamma + \sigma_\eta \frac{n(x_i\gamma/\sigma_\eta)}{N(x_i\gamma/\sigma_\eta)} + \epsilon_i$$

U is calculated as $((P_t - P_0)/P_0) - R_m$, where P_t is the closing bid price on the first day of trading, P_0 is the offer price, and R_m is the return for corresponding periods on CRSP NASDAQ composite index. $THETA$ is calculated as the offer price divided by the average of the minimum and maximum appraised values of the converting thrift i . $TSUB$ is the percentage of the offer purchased by the management (MAN) and other priority subscribers. $DINT$ is the proportional change in the ten-year rate on Treasury bonds between the date of the subscription and the date of the public offering. $LOGCAP$ is the logarithm of the value of the total public offering. $SIGMA$ is the standard deviation of returns during the first 30 days following the conversion. $RANK$ is the rank assigned to the underwriter by Carter and Manaster (1990). PRR is the reciprocal of the offer price. D8082 is a dummy for the period before the conversion restrictions were fully repealed (1980–1982). The remaining D83 to D87 are annual time dummies. σ_η is the estimate of the standard deviation of the random variable proxying for proprietary information.

Explanatory Variable	(1)	(2)	(3)
Constant	-0.577** (-3.0)	-0.606** (-10.4)	0.029 (0.3)
<i>THETA</i>	0.473** (2.9)	0.634** (11.5)	0.390** (6.2)
<i>TSUB</i>	0.201** (4.2)	—	0.151** (4.8)
<i>MAN</i>	—	0.382** (3.0)	—
<i>DINT</i>	-0.511** (-3.7)	-0.452 (-3.2)	-0.420** (-3.6)
<i>LOGCAP</i>	—	—	-0.023** (-6.5)
<i>SIGMA</i>	—	—	2.670** (3.8)
<i>RANK</i>	—	—	-0.006 (-1.9)
<i>PRR</i>	—	—	-0.892 (-1.7)

our sample of 287 conversions experience an average 5 percent excess returns during the first day of the public offering. This underpricing represents the sum of the values of the mutual thrift's equity and of the growth opportunities to be undertaken with the issue proceeds as a percentage of the issue size. Consistent with this interpretation, we observe that underpricing peaks at 15 percent in 1985 to 1986, when market conditions favorably affected thrift values. We also observe that, in contrast to standard IPOs, where rationing of investors is thought to be an important factor in explain-

Table V—Continued

Explanatory Variable	(1)	(2)	(3)
D8082	0.062 (1.4)	−0.039 (−1.1)	0.005 (0.1)
D83	0.056 (1.8)	−0.024 (−0.8)	0.017 (0.6)
D84	0.088* (2.1)	0.083 (0.3)	0.043 (1.1)
D85	0.140** (3.7)	0.066** (2.5)	0.108** (3.4)
D86	0.049 (1.9)	0.024 (0.9)	0.027 (0.9)
D87	0.066** (2.6)	0.02 (0.7)	0.02 (0.6)
σ_η	0.032** (2.7)	0.023** (3.3)	0.025** (5.3)
L^R	277.96	270.00	274.36
L^{UR}	284.67	273.93	282.47
$2(L^{UR} - L^R)^a$	13.4	7.9	16.2

* Significant at 5 percent.

** Significant at 1 percent.

^a $2(L^{UR} - L^R)$ has a χ^2 distribution. The critical value for 1 d.f. at the 5 percent level is 3.84.

ing underpricing, a substantial number of priority investors choose not to participate in thrift conversions.

We explain much of the cross-sectional variation in underpricing as the result of a tradeoff faced by managers between, on the one hand, minimizing the issue size and thereby lowering the price they pay for the shares of the thrift and, on the other hand, increasing the issue size and thereby acquiring both valuable financial slack and opportunities for increased perquisite consumption. We do not find evidence for the proposition that managers maximize the issue size to increase the resources they control at the expense of investors. Instead, we observe a positive and significant relationship between the issue size choice and profits earned by initial investors. The issue size is larger (i.e., the offer price is set closer to the maximum of the independently appraised range) when depositor and management subscriptions are larger and when market conditions improve during the conversion process. The results persist when the empirical model is reestimated using a limited dependent variable technique that explicitly allows for investors' inferences about managers' proprietary information. In addition, the limited dependent variable estimates suggest that investors are less informed than managers even after observing the managers' issue size choice and personal holdings. These findings are consistent with the hypothesis that *in choosing the issue size*, manager and investor interests are aligned and that more valuable thrifts with greater growth opportunities choose larger issues.

Further supporting evidence for the aligned interests hypothesis is provided by the fact that the issue size choice and underpricing are affected differently by the arrival of two types of seemingly similar favorable information. Increases in the general level of equity prices of thrifts during the conversion process positively affect the issue size choice but do not affect underpricing. By contrast, decreases in the long-term interest rates do not lead to adjustments in the issue size but cause increased underpricing. This pattern of adjustment is plausible since increases in the thrift stock price index proxy for future growth opportunities, whereas decreases in interest rates primarily increase the value of the mutual thrifts' equity value.

Conversions are interesting because the incentives of managers of converting thrifts differ substantially from those of insiders in other types of IPOs. This difference occurs because a conversion is both an initial stock offering and an initial public offering. As a result, insiders and the public acquire their stakes at the same price, ruling out typical conflicts of interest between these different classes of shareholders. Conversions also offer an excellent opportunity for empirically testing asymmetric information models because a large sample from a homogeneous population can be constructed. As a result, it is possible to test conjectures from the IPO literature against specific alternatives.

As suggested by the IPO literature, the reputation of the underwriter, the offer price, and the standard deviation of after-market returns have significant explanatory power in predicting after-market price performance. Except for the standard deviation, all the IPO variables lose significance when combined with the issue size variables. Thus, there exists publicly available information which is as informative about after-market price performance as the IPO variables. This finding suggests that while the initial offer price is correlated with the value of the thrift, it may not be a dissipative signal of the thrift's value.

The finding that IPO variables appear to have explanatory power in the underpricing equation but lose significance when combined with our issue size variables may have more general relevance. It raises the possibility that if tested against models that take into account publicly available information on the incentives of managers, these IPO variables may not have significant explanatory power in underpricing in other types of IPOs. This suggests that "asymmetric information" and "signalling" models should be tested against explicitly specified alternatives to better assess their validity.

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