

# Working Paper Series

**Pricing IPOs of Mutual Thrift  
Conversions: The Joint Effect of  
Regulation and Market Discipline**  
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# *Pricing IPOs of Mutual Thrift Conversions: the Joint Effect of Regulation and Market Discipline*\*

by

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## ***Pricing IPOs of Mutual Thrift Conversions: The Joint Effect of Regulation and Market Discipline***

### **ABSTRACT**

A large number of mutual savings and loan associations (MSLs) converted their charters into stock ownership between the mid-1980s to mid-1990s. Because these conversions tended to generate windfall profits for insiders and investors, new conversion guidelines and regulations were proposed by the FDIC to make sure that prices of the conversion IPO were *right and fair*. As pointed out by Mr. Henry B. Gonzales, former chairman of the House Banking Committee, "conversion regulations of the Office of Thrift Supervision have ensured that insiders and acquirers don't benefit at the expenses of the institutions and its account holders."

This study examines the price behavior of the mutual-to-stock conversions from 1985 to 1996. We show that if the thrift members exercised their rights to subscribe the new shares allotted to them or were allowed to sell their rights, whether the conversion IPOs were under- or over-priced would not create any wealth transfer. Given the absence of wealth transfers, in order to guarantee full subscription, price discounts might be necessary. Empirically, we find that under-pricing was common for the thrift conversions, but not as significant as found in non-banking industries. We also examine the relationship between insider subscriptions and after-market price movements and find that insider-subscriptions have a positive correlation with after-market performance. We believe that insider-subscriptions can therefore be used as a "signal" to encourage unsophisticated mutual depositors to exercise their in-the-money rights. Finally, using options-pricing theory, we find that the underwriters' spreads can be explained by volatility but not by the relationship between the offering price and the estimated market price. Therefore, the use of uninsured rights, instead of rights with standby underwriting, appears to be a more cost-effective method of equity flotation for thrift conversions. This occurs because the "insurance premium" associated with the latter does not reflect the discount that would increase the probability of the offer's success.

## ***Pricing IPOs of Mutual Thrift Conversions: The Joint Effect of Regulation and Market Discipline***

During the early 1980s, most savings and loan associations (S&Ls) were mutual associations. Of the 3,126 S&Ls in 1983, 2,404, or about 77 percent, were mutual institutions. At the end of 1996, there were 565 mutual S&Ls, representing 42 percent of the total number of institutions. Over this fourteen-year period, a large number of mutual savings and loan associations (MSLs) converted their charters into stock ownership. The reasons for mutual associations' conversion to stock form have changed over the years. During the 1980s, many thrifts were undercapitalized and economically insolvent 1980s (see Barth, 1991; Brewer, 1989 and 1995; and Kane, 1989). A mutual to stock conversion was a way to encourage private capital to flow into the thrift industry, re-capitalizing troubled thrifts. During the 1990s mutual-to-stock conversions have been undertaken to finance expansion and to take advantage of the benefits available to a public company. These benefits include the establishment of stock benefit plans for management and employee and the ability to merge with other firms.

An S&L that is mutually owned by depositors can become a joint stock institution by offering its accumulated mutual equity for sale. A conversion from a mutual to a stock association allows firms to raise equity capital, reducing the probability of insolvency by providing a cushion against failure. Between 1983 and 1988, 571 S&Ls converted and raised \$10.1 billion in new equity (Maksimovic and Unal, 1993). While mutual-to-stock conversions provide an opportunity for an institution to raise capital, they could potentially generate windfall profits for insiders and investors. Before a conversion, a mutual association's depositors have

legal claims to the net worth of the institution, but these claims are not negotiable and therefore depositors cannot benefit from increased firm value. When a mutual converts, conversion investors, including participating managers and depositors, obtain claims whose value reflects their respective contributed capital plus a share of the mutual association's existing net worth. Thus, the proceeds from the conversion are not distributed to the existing depositors, but instead they become an addition to the association's assets. As a class, the investors who purchase the equity of a converting mutual association acquire the equity of the entire organization. This claim per share will be greater than the conversion subscription price per share. Because of this, mutual-to-stock conversions are closely regulated by Office of Thrift Supervision and the Federal Deposit Insurance Corporation to make sure, in part, that prices of conversion initial public offerings are *right and fair*. As pointed out by Mr. Henry B. Gonzales, former chairman of the House Banking Committee, "conversion regulations of the Office of Thrift Supervision have ensured that insiders and acquirers don't benefit at the expenses of the institutions and its account holders."

One regulation of particular interest differentiating mutual-to-stock conversions from other initial public offerings is the requirement that conversions must involve the public sale of stock in a manner similar to a standby rights offering to depositors and management with an underwriting agreement signed only at the expiration of the subscription rights (Masulis, 1987). These rights are non-transferable and designed to protect the proportionate interest of depositors. Conventional rights offerings can take one of three forms: uninsured (those involving no underwriter), rights-with-standby underwriting, and firm-commitment underwriting. Based on a non-conversion sample of firms, Eckbo and Masulis (1992) found that the choice between

uninsured rights, rights-with-standby underwriting, and firm-commitment underwriting depends on information asymmetries, shareholder characteristics and direct flotation costs. Smith (1977) has shown that uninsured rights offerings have lower flotation costs than rights offerings with standby underwriting. Flotation costs were 2.45 percent of the amount raised for uninsured rights offerings compared to 6.05 percent for rights offerings with standby underwriting (see Smith, 1977). Presumably, the higher cost is related to the underwriter's ability to market the issue at a higher price than otherwise (see Brealey and Myers, 2000). Eckbo and Masulis (1992) recommend rights-with-standby underwriting if current-stakeholder take-ups are expected to be low. Otherwise, the least expensive method, uninsured rights underwriting, is recommended.

We address the following questions concerning mutual-to-stock conversions between 1985 and 1996. Were the distributional concerns associated with thrift conversions justified? Did windfall profits occur in mutual-to-stock conversions? Were these profits related to management stake in the conversion shares? If the answer is yes, can this information be used to develop a policy to protect the welfare of small thrift depositors? Is the underwriter's spread, a measure of the flotation cost, related to the ratio of the offer price to the estimated price, a ratio that reflects the success of the offer? If the answer is no, then the right issuing thrifts did not benefit from paying the extra insurance premium to the underwriter.

We also examine the long-run post-offering performance of mutual-to-stock conversions. Hogue and Loughran (1999) document that bank initial public offerings (IPOs) from 1983 to 1991 underperformed several market indexes. However, their bank sample includes all types of financial institutions and thus, it does not allow them to distinguish between

the long-run performance of thrifts, banks, or bank holding company IPOs. Analyzing the long-run performance of only thrift conversions would add to the literature.

We demonstrate in Appendix A of this paper that as long as the thrift account holders exercise their rights, or are allowed to sell the rights allotted to them, wealth transfers will not occur irrespective of whether the conversions are under- or over-priced. In fact, we show that under-pricing may be an effective means to encourage small depositors to subscribe to the new shares, without inducing wealth transfers from the current account holders to new investors. Our findings have implications for the current debate in the international forum regarding the preferred method to sell IPOs: i.e., determining whose welfare should be paramount in determining the placement method. Great Britain recently established a policy that allows citizens to benefit directly from the IPOs of privatization by giving them priority in the allocation of issues and, in many cases, at promotional prices (see Benveniste and Busaba, 1997).

If depositors are to realize their appropriate claim to the value of the firm, they need adequate information about the potential of a conversion. Due to asymmetric information, however, this information may not be readily available to thrift account holders. We propose a simple mechanism to address this problem; a mandate that the subscriptions of thrift officers and directors be disclosed to the mutual deposit members. Based on the percentage of the conversion subscribed by insiders, the current account holders could decide whether to exercise their rights. This disclosure recommendation is based on the work of Leland and Pyle (1977) and is consistent with the Securities and Exchange Commission's position that full disclosure, rather than "fairness", is most important when setting IPO regulations (Ibbotson et al., 1994).



Leland and Pyle (1977) show 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. In a signalling equilibrium firm value is revealed by changes in management stockholdings. This theory argues that management is typically better informed about the expected future cash flows of the firm and, therefore, has an incentive to hold large stock positions only if they expect the future cash flows to be high relative to the firm's current value. Rational investors will consider managers' stock ownership decisions to be a credible signal of firm value. Downes and Heinkel (1982) find evidence consistent with this argument.<sup>1</sup> To further analyze this potential effect, we test whether insiders' subscriptions are positively correlated with the rate of return of the post-conversion stocks of the converted thrifts. Indeed, for various time horizons, we find a statistically significant relationship for the thrifts in our sample.

Also, we examine whether the subscription price discount is large enough to guarantee the offers success (that is, a 100% subscription rate). If so, then the rights-with-standby-underwriting required by the regulators should be replaced by uninsured rights offering. We relate underwriter spread to, among other things, the ratio of the offering price to the estimated price. We hypothesize that total dollar underwriter spread (including legal fees and other transactions costs) as a fraction of the total estimated gross proceeds of the securities being offered is unrelated to the actual total gross proceeds from the offering relative to the estimated total gross proceeds. Our empirical results support this conjecture. Therefore, the issuing thrifts did not benefit from paying the extra insurance premium as measured by spread.

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<sup>1</sup> Ritter (1984), however, demonstrates that the results obtained by Downes and Heinkel (1982) may be due to the "agency hypothesis." He also points out the possibility of simultaneous

The paper is organized as follows. Section I discusses the conversion regulations and procedures. Section II provides a review of the literature on thrift conversions. Section III presents a set of hypotheses examined in this paper. Section IV provides a discussion of the data and methodology. Section V reports our empirical results. Section VI offers some concluding remarks.

## **I. Thrift conversion regulations and procedures**

Although there have been some adjustments made to the rules governing mutual-to-stock conversions, the sales-of-stock method proposed by the now defunct Federal Home Loan Bank Board (FHLBB) in 1974 and the associated appraisal process remain the core of the current mutual-to-stock conversion rules administered by the Office of Thrift Supervision (OTS).<sup>2</sup> Williams (1994) described the guidelines as follows:

1. The stock of the institution must all be sold at its *fair market value*;
2. mutual members of the institution must be given *non-transferable rights* to subscribe to the stock on a priority basis. Purchases by officers and directors are limited in aggregate to 25% of the total conversion stock offering. Moreover, no person, alone or acting in concert with others, may purchase more than 5% of the conversion stock;
3. the members' rights to receive residual net worth in the event of a liquidation of the institution are carried forward in a "liquidation account";
4. windfall profits are limited by restricting the number of shares that can be acquired by any person or group, limiting dividends and distribution with respect to the stock, and limiting the

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equation bias if one of the right-side variables is causally affected by the dependent variables.

ability of any party or group, particularly insiders, to acquire control of the converted institution.

While much of the concern surrounding conversions deals with potential wealth transfers, the 'non-transferable rights' restriction may actually induce such transfers. Because smaller depositors may not have sufficient capital to acquire the new shares, even if the shares are priced below the fair market price, they may have to let their in-the-money options expire. This is consistent with Bohren, Eckbo, and Michaelsen (1997) who find that the take-up rate is exogenously determined by individual shareholder characteristics, which include personal wealth constraints, demand for diversification, and control benefits.

## **II. Literature review**

The mutual-to-stock conversion process has been evaluated from various perspectives. Rasmusen (1988), Dunham (1985), and Simons (1992) examined the economic and policy implications of mutual-to-stock conversions. Mester (1989) and Esty (1998) examined the performance of companies before and after conversions. Masulis (1987) evaluated the factors influencing the decision for S&Ls to convert from mutual to stock ownership and found that changes in technology and government policies put market pressure on mutual S&Ls to convert. Barth, Page, and Jahera (1999) examined price appreciation and the under-pricing of mutual-to-stock conversions. Pettigrew, Page, Jahera, and Barth (1999) analyzed the abnormal returns associated with mutual-to-stock conversions during 1992 and 1993 and to determine whether these returns are related to the dollar subscription of managers.

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<sup>2</sup> For a discussion of the changes see Williams (1994) and The Mutual Bank Conversion Act. S.1801.

The S&Ls' financial and operating characteristics, which affect the success of the conversion effort, have also been explored. Maksimovic and Unal (1993) show that managerial holdings and the offer price do not act as dissipative signals of value in thrift conversions. Using an event-study method, Jordan et al. (1988) find "a one-time wealth transfer from depositors not exercising their rights to initial shareholders." The regulatory and procedural effects on the under-pricing of initial public offerings, however, are not covered by these studies. Similar to Affleck-Graves and Miller (1989), this paper argues that in addition to other feasible explanations of the under-pricing phenomenon, such as compensation to uninformed investors, insurance against legal liability, certification, and signaling, regulatory and procedural factors contribute significantly to the underpricing of IPOs.<sup>3</sup> Unlike Affleck-Graves and Miller, we also focus on the wealth-transfer issue and use "signaling theory" to make policy recommendations.

Using event study methodology, Barth, Page, and Jahera (1999) find that thrift IPOs have a significant higher abnormal return than non-thrift IPOs. Pettigrew, Page, Jahera, and Barth (1999) show that the abnormal returns increase with the dollar subscription of managers.

### **III. Hypotheses**

A thrift conversions involve two major components: a rights offering to the current stakeholders, such as depositors and management; and an initial public offerings to the broader market, if the shares are not fully subscribed. In return for contributing capital, the equity holders obtain claims to both the original mutual equity and to the capital they have contributed. Windfall profits, if they exist, are therefore larger for outside investors. Before conversions, the mutual shareholders have legal claims to the net worth of the institution but these claims are not

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<sup>3</sup> See Ibbotson et al. (1994) for an excellent review of these theories.

negotiable and therefore they cannot benefit from increased firm value. Conversions relax these restrictions. The rather complex notification and approval procedures described above can be seen as a form of insurance against possible future legal challenges from the members of mutual thrifts (Durham, 1985). For example, to protect depositors' ownership rights during the conversion, regulatory agencies require that converting firms give depositors non-transferable rights. Because depositors could not sell the rights, they had to exercise them or lose their value. A rational, value-maximizing depositor-investor should buy into the conversion. However, only about 5 percent of all mutual association depositors ever participate in the stock offerings. Thus, while a rights issue gives depositors priority over other investors in a conversion, its non-transferable feature does not allow depositors-investors to take full advantage of the rights offering, leading to under-subscription and forcing a public offering. On the other hand, if the rights offerings is fully subscribed, it could lead to more concentrated ownership (Kothare, 1997), which may not be desirable. It has been argued that thrift depositors often are not sophisticated investors and will therefore not have the expertise to monitor the management of the company. This may exacerbate any agency problems existing in the industry (see Rasmusen, 1988; and Mester, 1989).

By applying the adverse selection effects (ASE) proposed by Eckbo and Masulis (1992) and the contingent claims method of Smith (1977), we argue that a deep discount rights offering can be a mechanism to prevent wealth transfers, especially when the expected subscription rates are low. Eckbo and Masulis (1992) extend the Myers-Majluf (1984) mechanism to allow the current shareholders to participate in the sale of the issue and give underwriters an informational role to play. Unlike industrial companies that finance their

investments by either issuing rights to their current shareholders *or* by initial public offerings, mutual to stock conversions involve both financing methods, and therefore must be analyzed simultaneously. Moreover, similar to the utility industry, mutual and stock thrifts are regulated and therefore the risk of adverse-selection may be lower as documented by Smith (1986) and Eckbo and Masulis (1992). Beatty and Ritter (1985) argued that security under-pricing is a result of ex ante uncertainty, and rational investors will demand that more money be left on the table. The 1980s were characterized by a significant number of financially distressed thrifts. Mutual-to-stock conversions were one method to draw private capital into the industry in order to re-capitalize troubled thrifts. However, the 1990s were characterized by relatively less financial distress on thrifts. Thus, the average under-pricing should be more during the financial distressed period of the 1980s than in the financially healthy period of the 1990s. This leads to our first hypothesis:

*Hypothesis 1: The "under-pricing hypothesis"- Thrift mutual-to-stock conversions are under-priced and this under-pricing will be more severe during periods of financial distress.*

A rights discount, however, is not sufficient to prevent wealth transfers. For that reason, in addition to under-priced stock offerings, we propose another mechanism based on Leland and Pyle (1977). In Leland and Pyle, changes in management stockholdings may signal firm quality. Because management of a mutual thrift is better informed about the expected future cash flows of the converted firm, managers have an incentive to hold large stock positions only if they expect the future cash flows to be high relative to the firms' current value. By sharing

management's subscription rates with the mutual thrift depositors, they will be able to make more informed decisions about their own subscription. This leads to our second hypothesis:

*Hypothesis 2: The "signaling hypothesis"- After-market performance of mutual-to-stock conversions is positively correlated with insiders' subscription.*

Finally, we also consider whether the underwriter spread is related to, among other things, the ratio of the offering price to the estimated price. We hypothesize that total dollar underwriter spread (including legal fees and other transactions costs) as a fraction of the total estimated gross proceeds of the securities being offered is unrelated to the actual total gross proceeds from the offering relative to the estimated total gross proceeds. We hypothesize that lower expected rights take-up from the depositors may explain why thrifts and regulators prefer rights with standby underwriting or firm commitment underwriting to uninsured rights, which has been found to be less costly. Under-pricing can be viewed as a premium to encourage exercise of the rights and thus enhances ownership protection. However, since under-pricing reduces the risk of under-subscription, uninsured rights may be a more cost-effective method in raising capital for thrifts, unless the insurance premium, measured by spreads or underwriters' discounts, of the standby agreement is reduced to reflect the price discount. We conduct an empirical examination to test whether the spreads are affected by the under-pricing. Specifically, we analyze the relationship between spreads, the volatility of daily stock returns, and an indicator of the discount: the ratio of the offer price to the estimated price. Therefore, our third hypothesis:

***Hypothesis 3: The "floatation cost hypothesis"- The spreads/underwriters'***

*discounts of the thrift IPOs were not affected by the under-pricing, as measured by the ratio of offer price and estimated price.*

**IV. Methodology and data**

**A. Sample and Data Sources**

For our analysis we collect mutual-to-stock conversion data from SNL Securities (SNL) from 1985 to 1996 for 512 thrifts. For each conversion, SNL provides the name of the thrift, ticker symbol, the IPO date, type of conversion (standard conversion, merger conversion, or supervisory conversion), the number of shares offered, the total shares issued, the offering price, gross proceeds, percent of subscription, insider subscription rate, offering expenses, percentage sold in subscription, over-allotments, name of the underwriter, underwriter discounts, and the name of the appraiser. Conversion assets and several items listed in the pro-forma statement such as total equity, book value, and earnings per share are also available. Market data such as stock price one day, one week, one month, and three months after issue are also provided. Additional daily price information for the conversion stocks are collected from CRSP Daily NYSE and AMEX tapes, or the CRSP Daily OTC tapes. After adjusting for missing data, our total sample size is 399 companies. We divided the sample period into two sub-periods: 1985-1991 and 1992-1996. Year-end 1991 was selected as the ending year for the 1980s financial distress period, in part, because the passage of Federal Deposit Insurance Corporation Improvement Act of 1991 introduced prompt correction action and imposed more stringent capital requirements on depository institutions. Of the 399 conversions in our final



dataset, 200 observations were over the 1985 to 1991 period, while the remaining 199 were over the 1992-1996 period.

## B. Methodology

We examine the “under-pricing hypothesis” using descriptive statistics and Z-tests. The “signaling hypothesis” and the “floatation cost hypothesis” are examined using regression analysis. To examine the correlation between after-market returns of converting thrifts and insider subscription, we use the following model:

$$R_{j,t} = \beta_0 + \beta_1(Insider)_j + \varepsilon_{j,t} \quad (1)$$

where  $R_{j,t}$  is the after-market return on the  $j$  conversion in period  $t$ ; *Insider* is the insider-subscription rate; and  $\varepsilon_{j,t}$  is an error term. In a signaling equilibrium, firm value is revealed to depositors-investors through the portfolio decisions of insiders (management and directors). The greater is the insiders’ stake, the greater is the after-market price performance. To control for variation in the overall stock market, we include a market index (*Index*) in some of the specifications. Barth, Page, and Jahera (1999) found that abnormal returns were positively correlated with the size of the offering proceeds. We use the natural logarithm of total gross proceeds (*SIZE*) to capture the proceeds effects. In some of our empirical specifications, we use the ratio of market value of capital divided by the book value of capital (*Market/Book*) to capture future investment opportunities. If the insider-subscription rate captures insiders’ perceptions of future investment opportunities, then *Insider* and *Market/Book* would be positively correlated. We report results using these variables separately in the regression equation.

We use the three-factor market model of Fama and French (1993) to examine the long-run stock market performance of converting thrifts. The model takes the following form:

$$(R_{p,t} - RF_t) = \alpha + \beta(R_{M,t} - RF_t) + s_pSMB_t + h_pHML_t + \varepsilon_{p,t} \quad (2)$$

where  $(R_{p,t} - RF_t)$  is the return on portfolio p in excess of the risk-free rate;  $(R_{M,t} - RF_t)$  is the excess return on a broad market portfolio;  $SMB$  is the difference between return on a portfolio of small stocks and the return on a portfolio of large stocks;  $HML$  is the difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks; and  $\varepsilon_{p,t}$  is an error term. This equation is estimated using monthly data from August 1985 to December 2000. The test is to determine whether  $\alpha$  is significantly different from zero. A positive  $\alpha$  would indicate that portfolio p outperform the market, while a negative  $\alpha$  would indicate that portfolio p underperform the market. To test hypothesis 2, we divided the sample of thrift conversions into two groups: high and low subscription. A conversion is labeled high subscription if the insider subscription rate is greater than the median rate for the sample. If the insider subscription rate is below the median, a conversion is labeled low subscription. Equation (3) is estimated by weighted least-squares, where the weights are the square root of the number of conversions in each month.<sup>4</sup>

To further examine long-run performance, we calculate the average annual returns for each post-conversion event year and compare the results against three benchmarks: the CRSP value-weighted portfolio of the firms on the New York Stock Exchange, American Stock Exchange, and Nasdaq; the CRSP value-weighted portfolio of firms only on the Nasdaq; and

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<sup>4</sup> See Houge and Loughran for a discussion of this point.

an equally-weighted bank index. Annual buy-and-hold returns (including all distributions) start on the second CRSP-listed day after the conversion date and end (at the lower limit) on the five-year anniversary date of the conversion or the firm's delisting date.<sup>5</sup> The benchmark buy-and-hold annual returns (including all distributions) are calculated over an identical time period as for the conversions.

The flotation cost hypothesis is examined using a model presented in Yeoman (1993) who extended the work of Smith (1977). In this model the total dollar underwriter spread (including legal fees and other transactions costs) as a fraction of the total estimated gross proceeds of the securities being offered is related to daily stock return volatility, a measure of the risk-free interest rate, and the ratio of the offering price to the estimated price using the following empirical specification:

$$\frac{E_i}{\Sigma_i} = \alpha_0 + \alpha_1 \sigma_i + \alpha_2 \sigma_i^2 + \alpha_3 r + \alpha_4 \left( \frac{\Omega_i}{\Sigma_i} \right) + \eta_i \quad (3)$$

where  $E_i/\Sigma_i$  is the total dollar underwriter spread (including legal fees and other transactions costs) as a fraction of the total estimated gross proceeds of the securities being offered;  $\sigma_i$  ( $\sigma_i^2$ ) is standard deviation (variance) of daily stock returns;  $r$  is the risk-free rate of interest; and  $\Omega_i/\Sigma_i$  is the actual total gross proceeds from the offering relative to the estimated total gross proceeds; and  $\eta_i$  is an error term.

If the thrift manager maximizes the net proceeds from the rights offering, the total spread, as a fraction of the total estimated market price of the securities being offered, will be

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<sup>5</sup> There was one exception to this rule. We only use four years of data for the 1996 conversions.

positively correlated with the total optimal offering price. Using seasoned and unseasoned equity offerings from 1977 to 1988, Yeoman finds that  $\alpha_4$  is highly significant statistically. For our thrift samples, we hypothesize that the same coefficient will *not* be significant so that the spreads paid to the underwriter are not a function of offer price/estimated price, a ratio that also reflects the success of the new issues. The larger is the discounts (i.e., offer prices are lower relative to the estimated price), the smaller the ratio, and hence the more potential the IPOs' subscription.

## V. Empirical results

### 1. Descriptive statistics and characteristics of mutual-to-stock conversions

Table 1 shows the distribution of stock and mutual thrifts over the 1980-1996 period. At year-end 1980, about 15 percent of all thrifts were stock associations. At year-end 1996, stock associations accounted for about 58 percent of all thrifts. Table 2 shows the distribution of our 399 conversions over 1985 to 1996. The total gross proceeds of these offers are about \$14,470 millions. The largest number of offers and shares both occur in the 1986-1987 period. The characteristics of conversion are reported in Table 3. The table reveals that the median offer price is approximately \$10.0 and the median one-day after-market return of about 19 percent. This initial return is above the 15.8 percent reported in Ritter (1998), the 6.4 percent reported in Houge and Loughran (1999), and the 5% to 9% initial one-day return from thrift mutual-to-stock conversions reported by Maksimovic and Unal (1993) for the 1980-88 period.

Over the 1985-1991 period, the mean one-day after-market return was 63.6 percent, compared to 31.5 percent over the 1992-1996 period. The difference is statistically significant at the 1 percent level or better (t-ratio=-3.53). Based on these results, we conclude that the "under-pricing" hypothesis is strongly supported by the one-day after-market returns.

The average offering expense is about 6 percent and the percentage sold in subscription is very high (the mean is 72.27 percent, the median value is 100 percent). Therefore, under-subscription may not be a serious problem. The percentage of conversions sold to insiders, 8.60 percent, is much lower than that allowed by law.<sup>6</sup> Finally, the median of the underwriter' discount is 7 percent, exactly the same documented by Chen and Ritter (1998). The "price-fixing" issue raised by the authors may therefore be also relevant for the IPOs of thrift conversions.

## 2. Insider Subscription and Signaling

Was management of the mutual-to-stock conversions better informed about the expected cash flows as predicted by the signaling theory? Can the subscription rate of the officers and directors of the mutual thrifts be used to predict the after-market price movement? The results in Table 4 indicate that the answers to these questions are affirmative.

Panel A of Table 4 reports the results for the entire sample period; panel B reports the results for the 1985-1991 sub-period; and panel C reports the results for the 1992-1996 sub-period. In each panel, the results for one-day-after-market, one-week-after-market returns, one-month-after-market returns, and three-month-after-market returns are provided. The first row reports the associated simple regression results of after-market returns, defined as the

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<sup>6</sup> The maximum IPO sold to insiders, 37%, is not an error. While this appears to exceed the regulatory limit and we do not know the precise reason for this, we offer one possibility. The conversion regulations state that "... purchases by officers and directors in the aggregate are limited to between 25% and 35% of the total conversion stock offering.....In addition to the individual and aggregate management purchase limits, a converting institution may establish one or more tax-qualified ESOPs that may purchase, in the aggregate, up to 10% of the conversion stock on a first-priority basis....." (H.R. 3615; The Mutual Bank Conversion Act, Jan., 26, 1994, p.52). We speculate that the 37% maximum may include an ESOPs account.

differences between market price and offer price as a percentage of the offer price, and insider-subscription. The slope coefficients range from 0.0315 (one-day-after-market returns) to 0.0386 (three-month-after-market returns). The t-statistics of the one-day-after-market returns, one-week-after-market returns, one-month-after-market returns, and three-month-after-market returns are 4.49, 4.52, 4.20 and 3.74, respectively. Insider-subscription is therefore statistically significant in explaining after-market returns. These results, however, are based on the assumption that insider-subscription is the only important variable in predicting after-market returns. Other variables, such as size, market to book ratio, market index, may also be critical. These results are provided in the next three rows for each of the after-market return series.

Once these factors are included in the empirical specification, the insiders-subscriptions variable continues to be significantly correlated with after-market returns. The overall results in Table 4 support the "signaling hypothesis" that insider-subscription and after-market returns are highly correlated, suggesting that insider-subscription can be used to send creditable signal to small account holders of converting thrifts.

Kroszner and Strahan (1996) point out that during the 1980s, insolvency of individual thrifts and the thrifts deposit insurer created severe incentive problems that led institutions to take excessive risk. One way to address the under-capitalization problem in the thrift industry was to permit associations to convert from a mutual form of organization to a stock form. Thus, the 1980s conversions were done to encourage private capital to flow into the industry through mutual-to-stock conversions. Growth, on the other hand, might be the main motivation for thrift conversions during the 1990s [Houge and Loughran (1999), Peristiani and Wizman (1999)]. The results reported in Table 5 therefore may be affected by a "structural change". To examine

whether the relationship between after-market returns and insider subscription rate has changed over time, we divided the sample period into two sub-periods: 1985 to 1991 and 1992 to 1996. The results are reported in Panel B and Panel C. The 1985-1991 results are quite different from the 1992-1996 results: in all of the empirical specifications, insider subscription is statistically significant for all of the after-market returns over the 1985-1991 sub-period, while insider subscription variable is statistically significant on several of the empirical specifications. We perform a F-test on the restricted model (the whole period regression that requires all the parameters to be the same for both sub-periods) with the unrestricted models (the regressions for the two sub-periods. Since we run the regression separately, we did not place any restrictions on the coefficient estimates.) The results in Panel D of Table 4 indicate that the determinants of the 1980s and the 1990s indeed are significantly different from each other at the 5% and 1% level. The results are consistent with the previous literature that finds that conversions were driven by different motivation: conversion during the 1980s allowed insolvent thrifts to return to solvency by acquiring new equity from the capital markets. During the 1990s, conversions allowed thrifts, that were mostly financially sound, to acquire new capital to finance their activity.

### 3. Long-run performance

Table 5 provides time-series regressions of the returns of thrift conversions on market, size, book-to-market Fama-French (1993) realizations. The abnormal return measure  $\alpha$  is not statistically significant for the entire 1985-1996 conversions. However, the 1992-1996 conversions,  $\alpha$  is statistically significant, suggesting that the thrift conversions in this period outperformed the market by over 0.4 percent per month or 4.8 percent per year. When we

separate the sample into low and high insider subscription conversions (see Table 6), we find that over the long-run, high insider subscription conversions out-performed the market by more than low insider subscription conversions.

Tables 7 and 8 provide calculations of the average annual returns for each post-conversion event year and comparisons of the results against several benchmarks. The conversions out-perform the market in the first year after going public. The full sample (see Panel A Table 7) beat the return on the value-weighted NYSE-Amex-Nasdaq, Nasdaq, and bank indexes by 7.65, 10.84, and 5.49 percent, respectively, in the first year. Starting in the second year, the conversions significantly under-perform the equally-weighted bank index, and by the third year, the conversions are under-performing all of the three benchmarks. This same pattern is evidence in Panels B and C of Table 7 for the two sub-periods. When we separate the sample into low and high insider subscription conversions (Table 8), we find that high insider subscription conversions out-performed the market by more than the low insider subscription conversions. For instance, in Panel A of Table 9, the five-year market-adjusted buy-and-hold returns for low subscription conversions was -34.41 percent, while that for high subscription conversions was 21.89. The difference is statistically significant at 1 percent level or better ( $t$ -ratio=-3.38).

Our overall results are consistent with those reported in Houge and Loughran (1999) who found that bank IPOs experienced significantly positive abnormal returns over the first two years following the offering, while experiencing significantly negative abnormal returns starting with the third year after the offering.



In summary, we find that the average converting institution under-performs the several benchmarks. However, during the first year and in some cases the second year, the average converting institution actually report positive abnormal returns. In addition, we find that high insider subscription is associated with conversions that out-perform the market both over the short- and long-run.

#### 4. Equity Flotation and Underwriter Spreads

Table 9 reports the regression results from estimating equation (8). Because of data limitations our sample size was reduced to 103 conversions.<sup>7</sup> Based on these conversions, we find that percentage spreads are significantly influenced by the standard deviation of the daily stock returns. This is consistent with option pricing theory. The significant and negative coefficients of the variance, however, are not. It is possible that the model we use is misspecified and we may have also introduced a multi-collinearity problem by using both the standard deviation and variance of daily stock returns. Since the ratio of the offering price to the estimated market price is not significant statistically, spreads and under-pricing are therefore not correlated. As discussed before, a lower subscription price will guarantee the offering's success and prevent wealth transfers. Given this constraint, there is no need for mutual thrifts to pay an extra premium associated with rights-with-standby underwriting or firm commitments. Therefore, uninsured rights, that are the least expensive equity flotation method, are recommended.

## VI. Concluding remarks

In this study we find that, similar to the non-financial IPO literature, after-market prices of converted thrifts were generally higher than the subscription prices. The abnormal returns, however, were more than the manufacturing industry. Although we believe that the underpricing can be treated as a sufficient condition to encourage share subscription from the thrift account holders, we demonstrate that the total wealth of the depositors is not affected by setting the "right price" or "fair price" as long as depositors exercise their in-the-money rights or have the ability to transfer the rights. In other words, with rather limited adjustments to the current restrictions on thrift conversions, the commonly raised concerns about wealth transfers from the small depositors would be moot. However, it is possible that, because of budget constraints, small depositors may still not subscribe the under-priced shares. To prevent this from happening, we propose to signal the potential positive after-market returns to small depositors through the release of the insider subscription rate. Our empirical results show that this method is a feasible signal because the after-market returns and insider-subscription rates are highly correlated, especially for larger offerings. Finally, we document that underwriters' spreads are not affected by the underpricing of IPOs. The insurance premium for under-subscription is not reduced even if the mutual thrifts under-price their shares to guarantee the success of the rights offering. Uninsured rights instead of rights with standby underwriting or firm commitment should therefore be recommended. Note that the evidence obtained by Houge and Loughran (1999) indicates that the long term performance of most bank IPOs lagged behind three benchmarks

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<sup>7</sup> SNL did not have all the information regarding "estimated price" or mid-offer price (that we used as an estimate of the after-market price). In addition initial daily returns are not available

and the poor performance was concentrated among larger institutions with more aggressive loan growth.

Our empirical test of the "floatation cost" hypothesis is based on a model developed by Yeoman (1993). Adding an additional constraint to the model, using an approach similar to Benveniste and Busaba (1997) may be fruitful for future research. Finally, comparing the thrift conversions in the USA with the conversions of mutual building societies in the United Kingdom [see Valnek (1999), Haynes and Thompson (1999)] may shed light on the transferable-rights issue discussed earlier. In the United Kingdom, cash, instead of rights, were offered to the account holders of the building societies during demutualization. Moreover, the building societies appear to have outperformed stock retail banks, suggesting that the benefits of mutual organization may outweigh those of stock organization- a finding in conflict with the U.S. literature.

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for all conversions. As a result, we have to reduce our sample size to 103 institutions.

## Appendix A

### The wealth transfers and pricing of rights

In this appendix, we demonstrate that the wealth of thrift members will not be affected if they exercise their rights to subscribe new shares. According to Smith (1977), "since issuing rights is costly, it is in the firm's interest to insure the success of the offering. A lower subscription price for the rights provides this insurance... There is a corresponding fall in the market value of the stock, but this fall is like a stock split. It does not affect the wealth of the owners of the firm" (p.438). We demonstrate this in the following framework.

Assume that each depositor is given one right for a fixed amount of deposits in the mutual thrift during a specific time period and  $N$  rights are required to subscribe one new share at a subscription price  $S$ . If the market price of the share with right is  $P_w$ , then Brealey and Myers (2000) indicate that the value of the right is given by:

$$R = \frac{P_w - S}{N+1} \quad (\text{A1})$$

If the market price of the share after the issue is  $P_a$ , Brealey and Myers also have shown that the value of the right is given by:

$$R = \frac{P_a - S}{N} \quad (\text{A2})$$

Setting equation (A1) equal to equation (A2) and solving for  $P_a$  yields:

$$P_a = \frac{1}{N+1} (N \times P_w + S) \quad (\text{A3})$$

If the subscription price  $S$  is set equal to the  $P_w$  (i.e., rights are not under-priced), then:

$$P_a = P_w \quad (\text{A4})$$

In order for rights to have value  $S < P_w$ , so that:

$$P_a < P_w \quad (\text{A5})$$

Equation (A5) shows that the value of each share originally held by a mutual thrift member would be less after the issue if they were under-priced. However, despite the decline in share price, the total wealth per share (TWPS) of the member will not change if the rights are transferable or if the right holder exercises her rights:

$$TWPS = R + P_a \quad (\text{A6})$$

From the above discussion, TWPS is equal to  $P_w$ .

Our analysis requires that rights offerings not be under-subscribed. Hansen et al. (1986), however, find that underwritten rights offerings are seldom fully subscribed despite the fact that the subscription rights have value throughout the subscription period. They contribute the under-subscription to high subscription costs. Weston and Brigham (1982) believe that it is "shareholder forgetfulness" and Brealey and Myers (2000) use an "investors-on-vacation" argument to explain the same phenomenon. To avoid the "under-subscription" problem, we propose that regulators release management's subscription to mutual thrift depositors to encourage them to purchase their allotted shares. A necessary condition for this recommendation to be valuable is that insiders' subscriptions must contain a credible signal, i.e. insiders' subscriptions are positively correlated with the after-market price changes.

## Appendix B

### The development of equation (2)

Yeoman (1993) shows that if managers maximize the net proceeds of IPOs:

$$NP = \Omega - \Delta, \quad (\text{B1})$$

where NP = the net proceeds,

$\Omega$  = total offering price = gross proceeds, and

$\Delta$  = underwriter's total spread.

The optimal offering price is  $\partial NP / \partial \Omega = 0$  or when the change in the spread equals the change in the offering price:  $\partial \Delta / \partial \Omega = 1$ . Note that the spread is analogous to the insurance premium paid to the investment bank for underwriting an offering and the underwriting contract is equivalent to a portfolio consisting of a long position in the securities ( $\gamma V$ ), a cash payment to the company ( $NP - \gamma(NP - E)$ ), and a short position in a European call option (C):

$$U = e^{rt} \gamma V - NP - \gamma(NP - E) - 1/(e^{rt}) C, \quad (\text{B2})$$

where U = the value of the underwriting contract;

$\gamma$  = company's shares outstanding after the offering;

V = investment bank's estimate of the market price of the old shares;

E = the offering expenses;

r = the risk-free interest rate;

t = time to expiration of the option.

Using put-call parity, equation (B1) becomes

$$U = \Omega - NP - p, \quad (\text{B3})$$

where

$$p = (\Omega - \gamma(NP - E)) N(-d_2) - \gamma V N(-d_1), \quad (\text{B4})$$

and

$N(\cdot)$  is the cumulative normal density function,

$d_1 = \{ \text{Ln} \{ \gamma V / [(\Omega - \gamma (NP - E))] \} + \sigma^2 / 2 \} / \sigma$ , and

$d_2 = d_1 - \sigma$ , where

$\sigma$  = the instantaneous volatility.

Equation (B4) is simply the Black-Scholes (1975) option pricing formula for a put option (p) on securities with an expected price of  $\gamma V$ , an exercise price of  $(\Omega - \gamma (NP - E))$ ,  $r$  is set equal to zero and  $\sigma^2$  is measured in units of time such that  $t$ , the time to maturity of the option, equals one.

Combining equation (B3) with the optimal offering price condition from equation (B1), Yeoman shows that the natural logarithm (ln) of the total optimal offering price ( $\Omega$ ) as a fraction of the total estimated market price of the new shares ( $\Sigma$ ) can be expressed as:

$$\ln [(\Omega_i / \Sigma_i) + (\Delta + E_i) / V_i] = \gamma_0 + \gamma_1 \sigma_i + \gamma_2 \sigma_i^2 + \gamma_3 r \quad (\text{B5})$$

We modify this equation to study the IPOs of thrift conversions:

$$(E_i / \Sigma_i) = \alpha_0 + \alpha_1 \sigma_i + \alpha_2 \sigma_i^2 + \alpha_3 r + \alpha_4 \exp (\Omega / \Sigma_i) + \eta_i \quad (\text{B6})$$

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**Table 1. Dramatic growth of stock associations over the last two decades**

Year	Number of institutions	
	Stock	Mutual
1980	604	3371
1981	631	3109
1982	625	2652
1983	722	2404
1984	852	2442
1985	1023	2440
1986	1135	2325
1987	1213	2217
1988	1229	2018
1989	1147	2022
1990	1008	1531
1991	912	2159
1992	680	1208
1993	841	892
1994	823	723
1995	803	631
1996	769	565

Source: Thrift Call Reports, various years, Office of Thrift Supervision.

**Table 2. Sample mutual-to-stock conversion IPOs by year: 1985-1996**

Year	Number of offers	Gross Proceeds (in Millions)	Total Shares	Market value (in Millions)
1985	5	154.9	20,646,000	191
1986	95	3,918.0	391,484,184	4,247
1987	72	1,966.0	244,707,114	2,184
1988	13	200.9	49,842,525	213
1989	3	60.1	15,178,501	64
1990	7	280.2	45,586,744	334
1991	5	85.3	22,706,015	98
1992	21	516.9	67,829,056	604
1993	40	1,400.7	135,744,936	1,787
1994	45	3,004.7	250,270,134	3,682
1995	58	1,566.1	159,767,355	1,890
1996	35	1,316.1	122,276,503	1,482

**Table 3. Characteristics of conversion IPOs: 1985-1996**

	Mean	Median	Standard deviation	Maximum	Minimum
Gross proceeds	36,265,582.24	18,687,500	60,416,988.35	804,750,000	1,552,500
Shares offered	3,679,256.82	2,182,125	4,698,682.78	53,650,000	135,000
Shares issued	3,824,659.32	2,300,000	4,861,919.98	53,650,000	155,250
Offering Price (\$)	9.11	10.00	2.98	28.125	0.886
Initial return (%)	47.40	18.75	92.16	-57.11	918.58
Offering expenses (%)	6.62	5.90	5.04	68.25	0.0042344
Percentage sold to subscription (%)	72.27	100.00	36.56	100.00	0.00
over-allotment(%)	13.23	15.00	3.56	15.14	0.4
Underwriter Discount (%)	6.79	6.90	0.81	8.60	2.50
IPO sold to insiders (%)	8.60	7.20	6.43	37.10	0.50

**Table 4. Insider-subscription and after market rate of returns of mutual thrift conversions: 1985-1996**  
 \*\*\* Statistically significant at the 1% level; \*\* statistically significant at the 5% level; and \* statistically significant at the 10% level.

**Panel A: Entire period**

**One Day After**

Constant	Insider	Market/Book	Index	Size	Adj. R-Sq.	F
0.2055** (0.0752)	0.0315*** (0.0070)				0.0460	20.17
2.2677*** (0.2781)		-2.2201*** (0.2734)	10.3830* (5.7597)	-0.0283** (0.0127)	0.1474	23.94
1.9027*** (0.3046)	0.0192*** (0.0068)	-2.0170*** (0.2804)	11.1158* (5.7157)	-0.0233* (0.0127)	0.1622	20.26
0.2092 (0.2054)	0.0319*** (0.0070)		14.3063 (6.0534)	-0.0013 (0.0131)	0.0454	8.65

**One week After**

0.2035** (0.0797)	0.0336*** (0.0074)				0.0465	20.40
2.4261*** (0.2957)		-2.3551*** (0.2907)	2.1705 (2.2544)	-0.0322** (0.0135)	0.1405	22.68
2.0767*** (0.3237)	0.0201*** (0.0073)	-2.1447*** (0.2982)	2.2675 (2.2359)	-0.0270** (0.0135)	0.1547	19.21
0.2494 (0.2185)	0.0334*** (0.0075)		3.1844 (2.3713)	-0.0028 (0.0139)	0.0462	7.42

**One Month After**

0.2209** (0.0935)	0.0366*** (0.0087)				0.0401	17.63
2.7835*** (0.3569)		-2.7749*** (0.3406)	0.6001 (1.2952)	-0.0358** (0.0158)	0.1404	22.67
2.4002*** (0.3800)	0.0204*** (0.0085)	-2.5630*** (0.3498)	0.5408 (1.2877)	-0.0305* (0.0158)	0.1507	18.65
0.2491 (0.2567)	0.0362*** (0.0088)		1.2690 (1.3668)	-0.0030 (0.0164)	0.0374	6.16

**Table 4. Insider-subscription and after market rate of returns of mutual thrift conversions: 1985-1996, continued**

**Panel A: Entire period**

<b>Three Months After</b>							
<b>Constant</b>	<b>Insider</b>	<b>Market/Book</b>	<b>Index</b>	<b>Size</b>	<b>Adj. R-Sq.</b>	<b>F</b>	
0.2684** (0.1108)	0.0386** (0.0103)				0.0315	13.95	
3.2086*** (0.4123)		-3.2358*** (0.4014)	0.7968 (0.8134)	-0.0421** (0.0187)	0.1395	22.51	
2.8208*** (0.4544)	0.0201** (0.0101)	-3.0224*** (0.4139)	0.9064 (0.8122)	-0.0367* (0.0188)	0.1459	18.00	
0.2632 (0.3080)	0.0392*** (0.0104)		1.3530 (0.8618)	-0.0032 (0.0194)	0.0328	5.50	



**Table 4. Insider-subscription and rate of returns of mutual thrift conversions: 1985-1996, continued**

**Panel B: 1985-1991 IPOs**

**One Day After**

Constant	Insider	Market/Book	Index	Size	Adj. R-Sq.	F
0.8343* (0.5021)		-1.3857*** (0.4318)	15.1122* (8.8953)	0.0582** (0.0278)	0.1058	8.85
0.1450 (0.5280)	0.0405*** (0.0117)	-1.1085** (0.4279)	17.9519** (8.6970)	0.0732*** (0.0127)	0.1529	9.98
-0.9307*** (0.3308)	0.0462*** (0.0117)		20.2475** (8.7769)	0.1005*** (0.0257)	0.1282	10.76

**One Week After**

0.9941* (0.5392)		-1.5140*** (0.4639)	1.6391 (3.3505)	0.0542* (0.0300)	0.0853	7.19
0.2921 (0.5676)	0.0417*** (0.0126)	-1.2347*** (0.4604)	2.5323 (3.2804)	0.0692** (0.0296)	0.1292	8.38
-0.9025 (0.3572)	0.0480*** (0.0126)		3.0542 (3.3259)	0.0995*** (0.0278)	0.1017	8.51

**One Month After**

1.2288* (0.6426)		-1.9031*** (0.5533)	0.5019 (1.8714)	0.0608* (0.0355)	0.1896	7.53
0.5174 (0.6791)	0.0428*** (0.0151)	-1.6257*** (0.5522)	0.4066 (1.8389)	0.0763** (0.0353)	0.1213	7.87
-1.0541** (0.4290)	0.0506*** (0.0151)		1.0096 (1.8628)	0.1158*** (0.0333)	0.0869	7.32

**Three Months After**

1.6864** (0.7871)		-2.4119*** (0.6666)	1.1075 (1.1730)	0.0536 (0.0432)	0.0886	7.45
0.9283 (0.8381)	0.0441** (0.0182)	-2.1115*** (0.6701)	1.2484 (1.1602)	0.0704 (0.0432)	0.1107	7.19
-1.1538** (0.5273)	0.0548*** (0.0183)		1.7671 (1.1743)	0.1243*** (0.0406)	0.0701	6.00

**Table 4. Insider-subscription and rate of returns of mutual thrift conversions: 1985-1996, continued**

**Panel C: 1992-1996 IPOs**

**One Day After**

Constant	Insider	Market/Book	Index	Size	Adj. R-Sq.	F
2.6736*** (0.5155)		-3.2378*** (0.2617)	2.8085 (5.1646)	-0.0210 (0.0311)	0.4515	55.33
2.8199*** (0.6555)	-0.0022 (0.0060)	-3.2725*** (0.2791)	2.8254 (5.1763)	-0.0273 (0.0356)	0.4490	41.34
0.6741 (0.8207)	0.0221*** (0.0074)		3.2728 (6.7484)	-0.0330 (0.0464)	0.0635	5.48

**One Week After**

2.8254*** (0.5257)		-3.4287*** (0.2675)	3.1971 (2.1927)	-0.0229 (0.0317)	0.4755	60.84
3.1017*** (0.6674)	-0.0042 (0.0062)	-3.4938*** (0.2847)	3.3598 (2.2091)	-0.0347 (0.0363)	0.4741	45.62
0.8158 (0.8519)	0.0217*** (0.0078)		3.6375 (2.9363)	-0.0412 (0.0482)	0.0707	6.02

**One Month After**

3.1239*** (0.5699)		-3.8211*** (0.2897)	1.9577 (1.3848)	-0.0260 (0.0344)	0.4844	63.01
3.3404*** (0.7236)	-0.0033 (0.0067)	-3.8730*** (0.3093)	1.9927 (1.3893)	-0.0352 (0.0393)	0.4824	47.14
0.8370 (0.9328)	0.0256*** (0.0084)		0.8187 (1.8593)	-0.0433 (0.0527)	0.0688	5.88

**Three Months After**

3.0493*** (0.6412)		-4.2306*** (0.3222)	2.3364** (0.9690)	-0.0066 (0.0387)	0.4804	62.02
3.0647*** (0.8436)	-0.0002* (0.0046)	-4.2335*** (0.3396)	2.3292** (1.0042)	-0.0073 (0.0456)	0.4777	46.27
0.6110 (1.0981)	0.0290*** (0.0096)		1.2856 (1.3394)	-0.0305 (0.0610)	0.0642	5.53

**Table 4. Insider-subscription and rate of returns of mutual thrift conversions: 1985-1996, continued**

**Panel D: Test of Structural Change between 1980s and 1990s using the empirical specification that includes all of the right hand side variables.**

	<u>SSE(R)</u> <sup>1</sup>	<u>SSE(U1)</u> <sup>2</sup>	<u>SSE(U2)</u> <sup>3</sup>	<u>F-STATISTICS</u>
One-day	280.46	216.39	36.28	8.56**
One-Week	318.04	252.26	37.75	7.52**
One-Month	436.60	359.62	44.34	6.29**
Three-month	611.43	525.34	53.34	4.40**

1. Error sum of squares of restricted model: 1983-1996.
2. Error sum of squares of unrestricted model- 1980s.
3. Error sum of squares of unrestricted model- 1990s.

**Table 5. Time-series regression of equally-weighted monthly returns of thrift IPO portfolio on market, size, and book-to-market Fama-French (1993) realizations.**

The table reports the weighted least squares results for the following three factor model:

$$(R_{p,t} - RF_t) = \alpha + \beta(R_{M,t} - RF_t) + s_pSMB_t + h_pHML_t + \varepsilon_{p,t}$$

where  $(R_{p,t} - RF_t)$  is the return on portfolio p in excess of the risk-free rate;  $(R_{M,t} - RF_t)$  is the excess return on a broad market portfolio; *SMB* is the difference between return on a portfolio of small stocks and the return on a portfolio of large stocks; *HML* is the difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks; and  $\varepsilon_{p,t}$  is an error term. This equation is estimated using monthly data from August 1985 to December 2000.

**Panel A. 1985-1996 IPOs**

$\alpha$	$\beta$	S	H	Adj. R-Sq.	F
0.0775 (0.2368)	0.9025*** (0.0585)	0.7151*** (0.0763)	1.0133*** (0.0984)	0.6201	101.10

**Panel B. 1985-1991 IPOs**

0.0008 (0.3149)	0.9028*** (0.0748)	1.0560*** (0.1261)	1.0556*** (0.0682)	0.6467	83.97
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**Panel C. 1992-1996 IPOs**

0.4414* (0.2399)	0.7589*** (0.0692)	0.4851*** (0.0704)	0.7869*** (0.0943)	0.5582	46.06
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**Table 6. Time-series regression of equally-weighted monthly returns of thrift IPO portfolio on market, size, and book-to-market Fama-French (1993) realizations by insider subscriptions**

The table reports the weighted least squares results for low and high insider subscription using the following three factor model:

$$(R_{p,t} - RF_t) = \alpha + \beta(R_{M,t} - RF_t) + s_pSMB_t + h_pHML_t + \varepsilon_{p,t}$$

where  $(R_{p,t} - RF_t)$  is the return on portfolio p in excess of the risk-free rate;  $(R_{M,t} - RF_t)$  is the excess return on a broad market portfolio;  $SMB$  is the difference between return on a portfolio of small stocks and the return on a portfolio of large stocks;  $HML$  is the difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks; and  $\varepsilon_{p,t}$  is an error term. This equation is estimated using monthly data from August 1985 to December 2000. Low insider subscription conversions are those in which the share of the initial public offering is below the median share for the sample, and the high insider subscription conversions are the ones in which the share is above the median share.

**Panel A. 1985-1996 IPOs**

	$\alpha$	$\beta$	S	H	Adj. R-Sq.	F
<b>Low</b>	-0.1327 (0.2896)	1.0466*** (0.0697)	0.7636*** (0.0899)	1.1136*** (0.1172)	0.6002	91.57
<b>High</b>	0.2996 (0.2212)	0.7429*** (0.0559)	0.6786*** (0.0745)	0.9423*** (0.0950)	0.5701	82.34

**Panel B. 1985-1991 IPOs**

<b>Low</b>	-0.2361 (0.3559)	1.0770*** (0.0923)	1.1402*** (0.1577)	1.1888*** (0.1963)	0.6248	73.73
<b>High</b>	0.2442 (0.2993)	0.7078*** (0.0723)	0.9758*** (0.1203)	0.9341*** (0.1458)	0.5782	63.15

**Panel C. 1992-1996 IPOs**

<b>Low</b>	0.3613 (0.2978)	0.8392*** (0.0829)	0.5055*** (0.0821)	0.8352*** (0.1121)	0.5100	38.13
<b>High</b>	0.5422** (0.2479)	0.6837*** (0.0737)	0.4876*** (0.0781)	0.7978*** (0.1025)	0.4914	35.14



**Table 7. Average annual returns of the IPOs relative to the average annual returns on several benchmark indexes (percent)**

This table presents the annual buy-and-hold returns (including all distributions) starting on the second date after the IPO and ending (at the lower limit) on the five year anniversary date of the offering or the firm's delisting date.

$$R_{j,\text{post}} = \left[ \prod_{t=1}^T (1 + r_{j,t}) - 1 \right] \times 100\%$$

where  $R_{j,\text{post}}$  is post conversion return;  $r_{j,t}$  is the daily stock return on the  $j$  conversion;  $t = \text{one}$  is the first day after the conversion date; and  $T$  is the ending day. The benchmark buy-and-hold annual returns (including all distributions) are calculated over an identical time period as each IPO. The daily bank index is created by equally weighting an initial sample of about 150 banking organizations. The difference between the annual return on the thrift IPOs and the annual return on a benchmark index is:

$$\left[ \prod_{t=1}^T (1 + r_{j,t}) - 1 \right] \times 100\% - \left[ \prod_{t=1}^T (1 + r_{I,t}) - 1 \right] \times 100\%$$

where  $r_{I,t}$  is the daily return on benchmark index  $I$ . The z-statistics (in parentheses) test the equality of distributions for matched pairs of observations using the Wilcoxon matched-pairs signed-ranks test.

**Panel A: 1985-1996 IPOs**

	Post-IPO Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
Thrift IPOs	21.02	18.92	9.64	-0.94	18.46
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	7.65	1.75	-10.60	-15.66	2.83
(z-statistic)	4.55	0.47	-6.39	-8.13	-0.44
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted Nasdaq index	10.84	2.82	-9.23	-19.50	-6.12
(z-statistic)	7.10	1.14	-5.36	-8.46	-2.63
Difference between the annual return on the thrift IPOs and the annual return on the equally-weighted bank index	5.49	-8.25	-13.12	-12.44	-10.43
(z-statistic)	3.07	-6.77	-8.73	-7.62	-5.49
Number of firms	399	399	390	364	325

**Table 7. Average annual returns of the IPOs relative to the average annual returns on several benchmark indexes (percent) (Continued)**

**Panel B: 1985-1991 IPOs**

	Post-IPO Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
Thrift IPOs	10.02	12.04	-2.40	-17.60	26.51
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	1.37	3.20	-20.19	-24.91	10.24
(z-statistic)	-0.66	0.67	-6.93	-7.98	1.33
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted Nasdaq index	8.61	6.28	-13.87	-20.55	2.74
(z-statistic)	3.74	2.18	-5.40	-7.33	-0.26
Difference between the annual return on the thrift IPOs and the annual return on the equally-weighted bank index	8.11	-1.45	-15.48	-16.98	-14.46
(z-statistic)	3.61	-1.42	-5.64	-6.21	-4.01
Number of firms	200	200	194	186	173

**Panel C: 1992-1996 IPOs**

	Post-IPO Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
Thrift IPOs	32.09	25.83	21.55	16.48	9.31
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	13.96	0.29	-1.11	-6.00	-5.60
(z-statistic)	7.18	-0.08	-1.21	-2.98	-2.64
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted Nasdaq index	13.08	-0.66	-4.64	-18.41	-16.49
(z-statistic)	6.27	-0.72	-1.98	-4.82	-3.53
Difference between the annual return on the thrift IPOs and the annual return on the equally-weighted bank index	2.86	-15.09	-10.77	-7.69	-5.86
(z-statistic)	0.62	-8.23	-6.88	-4.49	-3.84
Number of firms	199	199	196	178	152



**Table 8. Average annual returns of the IPOs relative to the average annual returns on the value-weighted NYSE-Amex-Nasdaq index for high and low insider subscription (percent)**

This table presents the annual buy-and-hold returns (including all distributions) starting on the second date after the IPO and ending (at the lower limit) on the five year anniversary date of the offering or the firm's delisting date.

$$R_{j,post} = \left[ \prod_{t=1}^T (1 + r_{j,t}) - 1 \right] \times 100\%$$

where  $R_{j,post}$  is post conversion return;  $r_{j,t}$  is the daily stock return on the  $j$  conversion;  $t = one$  is the first day after the conversion date; and  $T$  in the ending day. The benchmark buy-and-hold annual returns (including all distributions) are calculated over an identical time period as each IPO. The daily bank index is created by equally weighting an initial sample of about 150 banking organizations. The difference between the annual return on the thrift IPOs and the annual return on a benchmark index is:

$$\left[ \prod_{t=1}^T (1 + r_{j,t}) - 1 \right] \times 100\% - \left[ \prod_{t=1}^T (1 + r_{i,t}) - 1 \right] \times 100\%$$

where  $r_{i,t}$  is the daily return on benchmark index  $I$ . The z-statistics (in parentheses) test the equality of distributions for matched pairs of observations using the Wilcoxon matched-pairs signed-ranks test.

**Panel A: 1985-1996 IPOs**

	Post-IPO Year					5 year buy-and hold returns
	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Low subscription IPOs</b>						
Thrift IPOs	20.90	17.35	5.03	-10.57	13.13	<b>63.24</b>
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	5.51	-0.29	-15.23	-22.71	-0.14	<b>-34.41</b>
(z-statistic)	1.96	-0.51	-6.15	-7.68	-0.80	
Number of firms	199	199	196	178	156	
<b>High subscription IPOs</b>						
Thrift IPOs	21.15	20.48	14.29	8.29	23.39	<b>127.87</b>
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	9.77	3.78	-5.93	-8.92	5.57	<b>21.89</b>
(z-statistic)	4.58	-1.18	-2.89	-3.65	0.20	
Number of firms	200	200	194	186	169	
T-statistic	-1.42	-1.44	-2.67	-3.70	-0.96	<b>-3.38</b>

**Table 8. Average annual returns of the IPOs relative to the average annual returns on the value-weighted NYSE-Amex-Nasdaq index for high and low insider subscription (percent) (Continued)**

**Panel B: 1985-1991 IPOs**

	Post-IPO Year					5 year buy-and hold returns
	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Low subscription IPOs</b>						
Thrift IPOs	8.78	8.00	-7.31	-23.45	19.51	<b>16.78</b>
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	-0.44	0.53	-26.41	-29.64	3.13	<b>-46.36</b>
(z-statistic)	-0.76	-0.30	-6.51	-6.29	-0.17	
Number of firms	105	105	102	97	89	
<b>High subscription IPOs</b>						
Thrift IPOs	11.38	16.50	3.04	-11.22	33.92	<b>79.88</b>
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	3.36	6.16	-13.28	-19.76	17.78	<b>14.57</b>
(z-statistic)	-0.10	1.22	-3.24	-4.81	2.06	
Number of firms	95	95	92	89	84	
T-statistic	-0.83	-1.15	-2.36	-1.77	-1.47	<b>-2.45</b>

**Panel C: 1992-1996 IPOs**

	Post-IPO Year					5 year buy-and hold returns
	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Low subscription IPOs</b>						
Thrift IPOs	34.43	27.78	18.42	4.85	4.65	<b>115.14</b>
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	12.16	-1.20	-3.09	-14.41	-4.47	<b>-21.06</b>
(z-statistic)	3.71	-0.43	-1.50	-4.27	-1.45	
Number of firms	94	94	94	81	67	
<b>High subscription IPOs</b>						
Thrift IPOs	29.99	24.09	24.45	26.19	12.98	<b>171.28</b>
Difference between the annual return on the thrift IPOs and the annual return on the value-weighted NYSE-Amex-Nasdaq index	15.57	1.62	0.71	1.02	-6.50	<b>28.51</b>
(z-statistic)	6.45	0.34	-0.31	-0.06	-2.24	
Number of firms	105	105	102	97	85	
T-statistic	-0.88	-0.98	-0.98	-3.45	0.37	<b>-2.20</b>

**Table 9. Regression of percentage spread for conversion IPOs: 1992:1998**

1992 – 1998 (N = 103)							
Hypothesis	Intercept	Std. Dev.	Variance	Interest rate	OP/EP <sup>a</sup>	F	R <sup>2</sup>
	$\alpha_0 > 0$	$\alpha_1 > 0$	$\alpha_2 > 0$	$\alpha_3 > 0$	$\alpha_4 = 0$		
<b>Model A</b>							
Coefficient	.0598*	1.24*	-32.4**	-0.992	0.00032	3.97	0.14
P-Value	.0912	0.0878	0.0131	0.1535	0.3000		
<b>Model B</b>							
Coefficient	.0658*	1.27*	-33.2**	-0.968	0.00098	3.67	0.13
P-Value	.0849	0.0817	0.0117	0.1672	0.8822		

a: OP = Offer Price  
EP = Estimated Price

\*\* Significant at the 5% level.  
\* Significant at the 10% level.