Examining Bank SEOs: Are Offers Made by Undercapitalized Banks Different?*

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Abstract

Despite extensive monitoring, banking operations are often considered opaque, and despite explicit capital adequacy regulation, banks may have substantial discretion in their financing. Both monitoring and capital regulation have changed substantially over time, with the adoption of FDICIA being one important breakpoint. This article empirically studies seasoned equity offerings (SEOs) by banks to understand how opacity and capital regulation interact to determine the timing of bank SEOs and their market valuation. SEOs both by banks that are undercapitalized relative to regulatory standards and also well-capitalized banks are fully discretionary when it comes to SEOs, even before FDICIA. Both undercapitalized and well-capitalized banks experience similar and significantly negative stock price reactions to SEO announcements, and also have similar prior patterns of insider trading and similar economic drivers of the issuance decision. Moreover, post-SEO abnormal stock returns are similar to benchmark returns for both types of issuers in the long run, suggesting that, contrary to the well-documented evidence for industrial SEOs, investors understand the value implications of bank SEOs upon announcement. The evidence implies that undercapitalized banks' SEOs are more discretionary and that all bank SEOs are less opaque than implied by earlier studies.

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1. Introduction

Financial economists proffer various explanations for firms' equity issuance decisions and for attendant market responses to announcements of seasoned equity offerings (SEOs). Prominent explanations focus on information asymmetry, timing by insiders, and agreement/disagreement of insiders and investors.[1] Many empirical studies of these explanations exclude banks and financial institutions. Yet, as the recent financial crisis makes clear, banks are heavily reliant on access to equity capital. Given banks' increasing economic importance and systemic risk, understanding their external financing is an important issue. Moreover, banking is often considered opaque, and there are reasons to expect varying opaqueness across important classes of bank SEOs, so banks also represent a special opportunity to evaluate asymmetric information-based SEO theory.[2] This paper reports a study of the immediate and long-run stock price consequences of SEOs by banks focusing on just such an important classification.

Earlier work proposes that capital adequacy regulations are a key to understanding bank's SEOs, characterizing issuers that are well-capitalized relative to regulatory minimums as making "voluntary" offers, and undercapitalized issuers as making "involuntary" ones (Cornett and Tehranian, 1994; Cornett Mehran and Tehranian., 1998). Cornett and Tehranian argue that voluntary offers, like SEOs in general (Ross, 1977), signal poor future prospects. Undercapitalized banks' offers, in contrast, are characterized as non-informative—and are arguably less opaque—because issuing banks are under regulatory duress and have little choice. This reasoning implies that, while well-capitalized banks' offers should elicit a negative market reaction, undercapitalized banks' offers should not. Long-run returns following bank SEOs are also interesting. With bank opacity, investors in an inefficient stock market might systematically mis-evaluate the issue or the issuer, leading to long-run abnormal under-performance similar to or beyond what has been measured for non-bank SEOs (Loughran and Ritter, 1995). Further, because the need for capital is more obvious for undercapitalized banks, post-SEO stock performance between the two types of bank issuers might differ. Early important results from bank SEO samples analyzed by Cornett and Tehranian (1994) and Cornett, Mehran and Tehranian (1998) are consistent with immediate negative signals and long-run underperformance mainly for well-capitalized banks' SEOs.

Bank regulation and capital access have changed significantly since the time of the Cornett and Tehranian (1994) and Cornett, Mehran and Tehranian (1998) samples. The Federal Deposit Insurance

[1] Prominent examples include Myers and Majluf (1984), Lucas and MacDonald (1990), Baker and Wurgler (2002), and Dittmar and Thakor (2007), among others.

[2] There is conflicting evidence on bank opacity. Morgan (2002) finds a pattern of disagreement across Moody's and S&P bond ratings for banks, and argues that this suggests that banks are inherently opaque. Loans are a significant source of the disagreement, as are trading assets prominent on the books of the larger banks. On the other hand, Flannery (1998) argues that bank share prices adjust promptly to new information, and that CD and debenture rates sensibly reflect bank risks. Moreover, regulators, deposit insurers, subordinated-debt holders and equity holders all monitor banks and would be expected to enrich information flow. Krishnan, Ritchken, and Thomson (2005, 2006) show that bank-specific risk is an important determinant of subordinated-debt credit spread levels, and that subordinated-debt credit spreads contain information about future bank riskiness.

Corporation Improvement Act (FDICIA), regarded as the most important banking legislation in more than 50 years, was enacted in 1991 with significant provisions affecting both capital adequacy requirements and regulatory information flow (Benston and Kaufman, 1997). Bank SEOs in the post-FDICIA period are mostly by well-capitalized banks (at least prior to the 2008 crisis, which is beyond our sample period), as financial market considerations have become much more prominent in determining banks' capitalization levels. Empirical methodology has also evolved since the time of the earlier samples. We compare SEO-related outcomes in our full sample period covering both pre-FDICIA and post-FDICIA years with those of the pre-FDICIA sample period, which contains the bulk of our sample of undercapitalized-bank SEOs and roughly corresponds to the earlier studies' sample periods. One of our central goals is to evaluate whether the substantial change in bank regulations impacted investor understanding of the value consequences of bank SEO announcements, whether newer methodological adjustments lead to changes in conclusions, and whether our understanding of SEO theories as applied to banks should be adjusted.

We find that the mean announcement period abnormal stock return is significantly negative for both types of offers, and the cross-type difference is not significant. This raises the question of whether the degree of timing discretion might not actually differ across offers made by undercapitalized banks versus well-capitalized banks. We find direct evidence of timing flexibility for undercapitalized banks' offers, showing that both types are discretionary. Finally, we find that the long-run post-SEO stock returns do not underperform benchmarks for either type of issuers, suggesting that, on average, investors are able to sort through the opacity similarly for both types. In the next few paragraphs, we provide more detail and discuss how this evidence fits together to provide a picture of bank SEO value consequences.

The significantly negative mean abnormal return around SEO announcements for both types of bank issuers indicates that stock market investors do not perceive undercapitalized-bank offers to be economically different from those of well-capitalized banks.[3] If these investors are correct, it suggests that offers made by undercapitalized banks may not be timed differently (i.e., with less discretion) than well-capitalized bank offers, and with similar discretion to non-bank SEOs.

We develop several pieces of evidence that support that suggestion. First, SEO announcements for both types of issuers occur after a significant stock-price run-up, consistent with managers' being able to time new equity issuances for relatively good conditions as proposed by SEO theories.[4] Second, mean

[3] The significantly negative announcement period stock returns are also consistent with Myers and Majluf (1984), who predict a negative stock price reaction to the announcement of equity issues because of adverse selection in the decision to issue equity.
[4] Lucas and McDonald (1990) argue that undervalued firms wait for a stock-price run-up and then issue new equity to avoid dilution, whereas overvalued firms issue equity directly. Since firms issuing equity then tend to be overvalued on average, a negative announcement return is also natural. Dittmar and Thakor (2007) argue that SEOs are made when the level of agreement between managers and the shareholders has become high; in their model, a stock-price run-up may be evidence of growing agreement.

insider net sales in the quarter immediately prior to equity issuance are positive for both types of issuers, and the difference between the types is not statistically significant. Similar levels of pre-announcement insider selling for both undercapitalized and well-capitalized bank issuers imply similar degrees of managerial opportunism as managers anticipate the SEO. Third, recognizing that there are many ways to resolve capital crises and that our study focuses only on equity issuances, we ask whether undercapitalized banks appear to be under stronger duress from regulators to issue equity based on an examination of capital ratios at the quarter-ends that fall approximately six, twelve, eighteen and twenty-four months before the SEO announcement date. All but two of the undercapitalized issuers in our sample are also undercapitalized at each such earlier date, showing that banks have considerable time to shore up their capital ratios before resorting to an SEO.[5] Alternatives to SEOs for resolving capital shortfalls include reducing dividend payouts or asset growth, as well as mergers or other structural changes. Consistent with these possibilities, undercapitalized issuers in our sample have lower pre-SEO dividend payout ratios than in the post-SEO period. Furthermore, mean asset value in the pre-SEO period is significantly less than post-SEO. Finally, our results hold both for subsamples of banks that are involved in mergers during the sample period and those that are not.

To cap this evidence on issuance timing together in a more formal way, we estimate a logit model of SEO choice, finding that both undercapitalized and well-capitalized issuers have larger market-to-book ratios than non-issuers of the same capital-adequacy type, and that undercapitalization *per se* is not a strong driver of issuance. Overall, we conclude that undercapitalized issuers have needed new equity for quite some time, have tried other measures to shore up their capital, and have waited to issue new equity until their valuation has strengthened and insiders have adjusted their portfolios. Consistent with their SEO stock price reactions being similar to well-capitalized issuers that presumably have timing discretion, undercapitalized issuers also have timing discretion over SEOs.

Having concluded an investigation of the causes and short-term stock price effects of bank SEOs, we next turn to long-run performance after SEOs. We find that three year post-SEO stock returns do *not* underperform their benchmarks for either type of bank issuers, judging from buy-and-hold abnormal returns, and also 3- and 4-factor calendar time abnormal returns. These results contrast with findings of underperformance following non-bank SEOs (see, for example, Spiess and Affleck-Graves, 1995 and Loughran and Ritter, 1995). Valuations that are not systematically revised over the longer run indicate that investors immediately understand the reasons why banks raise new equity issues better than the reasons why other firms raise new equity. This evidence further helps explain our findings of significant

[5] Macey, Miller and Carnell (2001) argue that even under the strict capitalization rules of FDICIA, undercapitalized banks have sufficient time to shore up their capital through other means before they can be forced to issue equity. "Significantly-undercapitalized" banks, they say, may be forced to shore up their capital via the market but, even then, they can issue subordinated debt rather than equity.

insider sales before bank SEO announcements: insiders appear to take advantage of higher stock prices before the negative correction that occurs upon issue announcement. We also document mildly negative long-run operating performance that corroborates this reasoning.

These results help distinguish among the competing explanations of SEOs. Our finding of zero post-SEO long-run abnormal stock returns does not support behavioral frameworks like Baker and Wurgler's (2002) that predict negative long-run abnormal stock performance following an SEO. Overall, our findings support frameworks like Myers and Majluf's (1984), in which the SEO announcement itself appears to resolve the information asymmetry between insiders and stock investors. The results suggest that a negative announcement return fully reflects the information content of the SEO, so there is no post-SEO stock price underperformance in the long run. Prior insider selling is consistent with private information of managers that is ultimately reflected in the mildly poor operating performance over the long run, in line with asymmetric information and timing explanations of SEOs in a rational marketplace.

These empirical findings characterize both the full sample period and the pre-FDICIA sample period (though with fewer undercapitalized banks issuing post-FDICIA), suggesting that contrasting results based on earlier pre-FDICIA samples as in Cornett and Tehranian (1994) and Cornett, Mehran and Tehranian (1998) are likely due partly to changes in standard methodologies and partly to sampling differences. We explore and corroborate that explanation with specific results, and, with the benefit of a longer-term sample and methodological developments, we conclude that well-capitalized and undercapitalized bank SEOs are similarly timed, similarly priced, and similarly fit in with the general SEO reasoning above.

Our findings are interesting in light of the recent global financial crisis in which almost all large banks have needed to raise substantial equity, often under duress. Our pre-FDICIA evidence characterizes a time of strain in the banking sector, though not a time of such historic crisis. Negative market reactions upon market reaction of the bank-specific shortfall have recently been the rule. It remains to be seen whether long-run issuer performance will meet benchmark levels. We must leave to future studies the task of understanding the extent to which standard SEO theories can provide useful predictions under such extreme conditions.

The remainder of the paper is organized as follows. The next section describes our sample of bank SEOs in the context of capital adequacy regulation. Section 3 analyzes announcement period stock returns. Section 4 examines evidence related to the timing of SEOs. Section 5 examines post-SEO performance. Section 6 reports robustness checks, especially replication of methods from and comparisons to the earlier studies. Section 7 concludes.

2. Data

Our data comprises public offers of seasoned equity made by commercial banks and bank holding companies (BHCs) in the United States over the period 1983 through 2005. The sample begins in 1983 because the 17 largest banks were first required to comply with new capital standards in June of that year (see Moulton, 1987 and Cornett and Tehranian, 1994).

We draw SEO data from Thomson Financial's Securities Data Corporation (SDC) Platinum database. SDC Platinum provides the announcement date, issue date, issue proceeds, offer price, shares issued, listing, and lead underwriter identity. For each issue, we search the Lexis-Nexis newswires and the Dow Jones News Retrieval Publications Library (DJNR, now incorporated within Factiva) for articles reporting the announcement, to confirm the date. If the announcement date from our Lexis-Nexis and DJNR search differs from that reported in SDC, we use the Lexis-Nexis/DJNR date. We also cross check dates with the Investment Dealer's Digest (IDD) for offers made before 1996, and cross check with the SEC's EDGAR database for offers in 1996 and later. If the event date found from IDD or EDGAR differs from that reported by SDC, we use the IDD/EDGAR date.

We exclude all ADRs, secondary offers, and SEOs that have warrants or are part of a unit offer. We also examine Lexis-Nexis and DJNR to determine whether an issue is made pursuant to a previous shelf registration, and we exclude shelf registration offers. As a backup, we examine scanned cover pages of registration statements and prospectuses purchased from Disclosure Inc. for offers for which the issue date is close to the announcement date for evidence of a shelf registration. After these screens, we have a sample of 276 bank SEOs over 1983-2005.

2.1 FDICIA and Sub-sample Periods

In addition to analyzing the full sample period, we provide a separate focus on the early years of the sample period. This distinguishes the period prior to the Federal Deposit Insurance Corporation Improvement Act (FDICIA), as well as allowing comparison with important prior studies. FDICIA entails recapitalization of the Bank Insurance Fund, new risk-based deposit insurance premiums, "Prompt Corrective Action" provisions, the reform of the "Too-Big-to-Fail" doctrine, and increased prudential supervision (Mishkin, 1996). The "Prompt Corrective Action" provisions require the FDIC to intervene earlier and more vigorously when a bank fails capital adequacy standards. This feature is particularly relevant for our study in that it may affect both the impetus for strained banks to raise new capital and the opacity of their situations. It mandates that undercapitalized banks submit an acceptable capital restoration plan within 45 days, but also accords regulatory discretion on the reaction. For example, regulators can choose to place restrictions on asset growth, require the election of a new board of directors, prohibit deposits from correspondent depository institutions, prohibit capital distributions to any

controlling BHC, and/or require divestiture of non-bank subsidiaries or other activities deemed to pose excessive risk. Importantly, they can also require an undercapitalized bank to raise new equity.

We choose 1990 as the specific breakpoint in our sample because by this time both houses of Congress were considering bills containing various FDICIA-type clauses, making it likely that such measures would become law. Before the end of 1990, the passage of FDICIA was widely expected. There were also a number of related bills pending in Congress for the two years prior to the 1991 passage of the Act. For example, bills pressing for urgent repair of weak balance sheets, which eventually led to the "Prompt Corrective Action" provisions, increased in number beginning in 1989 (Kishan and Opiela, 2006). Further, there is a significant difference in the proportions of well-capitalized versus undercapitalized bank offers before and after 1990, suggesting a structural shift. Finally, examining the pre-1990's sub-sample provides comparability with previous bank SEO literature, especially Cornett and Tehranian (1994) whose sample period ends in December 1989. Therefore, we analyze both the full period (1983-2005) and the pre-FDICIA (1983-1989) period in our subsequent analysis.

2.2 Capital Adequacy

A bank's regulatory capital adequacy is determined by its total capital ratio, the ratio of Tier1 + Tier2 capital to assets. Financial statement information needed to calculate total capital ratios and some other necessary variables for our study is from the Federal Financial Institutions Examination Council's Reports of Income and Condition ("call reports") for commercial banks and from Y-9 statements for BHCs. We apply formulas published by the Board of Governors of the Federal Reserve System in the Federal Register every January (Title 12 Part 208 Appendix A for commercial banks and Part 225 Appendix A for BHCs). After 1989, we use formulas that reflect the new risk-based capital guidelines. Following those requirements, we compute the variable *Total Capital Ratio* for each sample bank or BHC. Details are provided in the Appendix. Our goal is to take the same view of bank capital as do bank regulators, considering the exact rules at each date. This should give us the most accurate reading as to whether a bank actually faced regulatory duress due to failing to satisfy capital adequacy standards.

We focus especially on the minimum total capital ratio a bank must attain to be considered "well-capitalized" according to the Federal Reserve guidelines (or "Zone 1" before the well-capitalized zone was established by FDICIA). Between 1983 and 1989, the required total capital ratio is 7%. In 1990 and 1991, it is 8%. In 1992 and after, it is 10%. We classify banks with *Total Capital Ratio* below these limits at the end of the quarter preceding the SEO announcement as undercapitalized issuers, and those above as well-capitalized issuers. For convenience of language, we often refer to these SEO subsamples as either "undercapitalized issues and "well-capitalized issues" (or offers), respectively.

Table 1 shows the distribution of these two subsamples of SEOs on a year-by-year basis. The bulk of the undercapitalized offers occur in the mid 1980's, soon after the introduction of capital requirements. The reduction in the number of offers in the period 1988–90 is probably due to poor market conditions, possibly a consequence of bank failures during this period. Well-capitalized offers peak in 1991-92, following imposition of FDICIA standards. By 1995, the banking industry had recovered significantly, with few banks being undercapitalized. There are not many undercapitalized issues in the 1990s.

We also measure the extent of a bank's under- or overcapitalization prior to the SEO as a fraction of total assets. *Undercapitalization* measures the new equity capital needed to meet capital requirements, and *Overcapitalization* measures the amount by which equity capital exceeds capital requirements. These variables, along with *Assets*, are calculated from call reports and Y-9 statements according to the requirements in the Appendix.

Table 2 provides descriptive statistics for the 73 undercapitalized offers and 203 well-capitalized offers in our sample. The average bank in our sample has around $10 billion in total assets prior to the issue, and the average SEO size is 1.66 percent of total assets. The total capital ratio is significantly lower for undercapitalized issuers than for well-capitalized issuers. The mean (median) extent of overcapitalization for the well-capitalized issuers is significantly higher than the mean (median) extent of undercapitalization for undercapitalized issuers. The undercapitalized issuers are, in general, barely undercapitalized as compared to the extent of overcapitalization of the well-capitalized issuers. Undercapitalized issuers are also smaller than well-capitalized issuers, but, somewhat strikingly, *Relative Issue Size*, defined as the ratio of gross issue proceeds exclusive of over-allotment options to total assets, is also smaller for undercapitalized issues.

We also employ daily and monthly stock return data from the Center for Research in Security Prices (CRSP) database. We use various accounting data from the Standard and Poor's Compustat database, as detailed in later sections. Other variables used in our analyses include *Nasdaq*, a dummy variable equal to one if SDC indicates that the stock trades on Nasdaq and zero otherwise, and *Underwriter Reputation*, the lead underwriter's Carter-Manaster score as modified by Professor Jay Ritter and drawn from his web site at *http://bear.cba.ufl.edu/ritter/rank.xls*.[6]

3. Announcement Period Stock Returns

Using CRSP Daily data, we calculate the market-model abnormal return for each SEO from day *i* through day *j* around the announcement date, denoted *CAR(i,j)*. We alternatively use several windows to allow for the possibility that investors might receive information at various points in time. Following

[6] The lead underwriter score is based on the prospectus, which shows all the investment banks in the underwriting syndicate. More prestigious underwriters are listed first, by brackets. If an underwriter always appears in the highest bracket, it is assigned the top ranking of 9.1 on a 0.1 to 9.1 scale.

common practice (see Eckbo, Masulis and Norli, 2007), the value-weighted CRSP index return is the market proxy. Following Cornett and Tehranian (1994), we employ market returns at two leads and two lags, plus the contemporaneous return, in the market model to compensate for non-synchronous trading (Scholes and Williams, 1977). Market model parameters are estimated over a 250-day window beginning 25 days after the issue date.[7]

Table 3 summarizes announcement period abnormal returns for four different windows. The significance of mean abnormal returns is assessed with Patell *z* statistics (Cornett and Tehranian, 1994, page 108). For all windows, the market reacts significantly negatively on average to both well-capitalized offer and undercapitalized offer announcements over both the full sample period and the pre-FDICIA sample period.[8] Standard event-study difference-of-means tests, also computed as in Cornett and Tehranian, show that the mean announcement reaction is not significantly different between undercapitalized and well-capitalized offers. We also report median abnormal returns and non-parametric tests. Wilcoxon-rank sum tests generally indicate no significant differences across well-capitalized versus undercapitalized issues, although for the (-3, +3) window the market reaction to undercapitalized issues is actually *more* negative than that for well-capitalized issues.[9]

3.1 Robustness checks

We subject our finding that the announcement period stock price reaction is significantly negative for both undercapitalized and well-capitalized issues to several robustness checks. We redefine undercapitalized and well-capitalized issuers in four different ways, as described below, and then we check whether mean announcement period abnormal return remains significantly negative for each type of issuers. For brevity, we characterize the conclusions only. A table of detailed results is available from the authors.

Allowing for a cushion above regulatory norms. A barely adequately capitalized bank might chose to issue equity to build a cushion, and the issue might be seen as similarly coerced as if it had failed the regulatory norm. In an economic sense, one could classify such offers as "undercapitalized." Therefore, we allow for a one percent cushion over the relevant regulatory norm in classifying an issue as an undercapitalized SEO. This step significantly increases the number of undercapitalized offers in our full sample to 122, of which 90 are in the pre-FDICIA sample period.

[7] Abnormal stock performance in the pre-announcement period, and on the announcement and issue dates can bias parameter estimates if these days are used in the estimation of the parameters of the market model (see, for example, Cowan, Nayar and Singh, 1991).

[8] As a robustness check, we also re-define the cumulative abnormal return as a market-adjusted return using the CRSP NYSE/AMEX/Nasdaq value-weighted market as an alternative to a market-model abnormal return. Our conclusion remains the same.

[9] One reason for this finding could be that (as we show later) extensively overcapitalized banks do not issue new equity even when the market-to-book ratio is high.

Defining "undercapitalized" banks using a bankruptcy probability. We apply Shumway's (2001) estimator of the probability of bankruptcy, which is based on the market value of equity, past excess returns, and past volatility, to each bank.[10] Issuers for which the bankruptcy probability is greater than the sample median are classified as undercapitalized in this sense of nearness to bankruptcy. By this standard, there are 138 undercapitalized issues in the full sample, of which 55 are in the pre-FDICIA sample period.

Using a non-time-varying capital adequacy norm. We base the undercapitalized/well-capitalized classification on an unchanging cutoff of 10 percent of total capital, corresponding to the most stringent regulatory capital adequacy norm in effect at any point in our sample period. By this standard, there are 132 undercapitalized issuers in the full sample, of which almost all—123—are in the pre-FDICIA period. This reflects the lower norm in that period, and probably also that fewer banks chose to exceed capital adequacy requirements for business reasons prior to the 1990s.[11]

Using extreme over- and undercapitalized quintiles. We perform our tests using only data from the two most extreme sample quintiles, based on total capitalization ratios. For this set-up, there are 15 undercapitalized issues in the full sample period and 12 in the pre-FDICIA period.

Under the first three methodological variations listed above, we find that the mean announcement period cumulative abnormal returns remain significantly negative for both well-capitalized and undercapitalized offers, with the differences being insignificant. The comparison holds for each of the four different announcement period windows examined, and for both the full and the pre-FDICIA samples. Under the fourth variation, which results in much smaller sample sizes, the results are qualitatively the same, but mostly statistically insignificant.

As a final extension, we consider two special subsamples for which there are particular reasons that investors might understand the motivation to issue more clearly than usual, and opacity might thus be reduced. If so, the subsample SEO reaction might be close to zero. First, we consider that the introduction of capital adequacy standards for the first time in 1983 may have represented a degree of regulatory inducement to issue equity for all banks. In 1983, bank-specific standards were set up for the 17 largest banks with the stipulation that they meet industry-wide standards by 1985 (Moulton, 1987 as cited in Cornett and Tehranian, 1994). With this in mind, we examine the pre-1985 issues of the 17 largest undercapitalized banks in that period of our sample. We find that the average announcement period abnormal returns for this sub-sample are significantly *more* negative on average (*CAR (-1, 0)*: -1.72 percent; *CAR (0,+1)*: -1.63 percent) than that of the full well-capitalized-bank sample. Second, we consider that merger and acquisition plans may affect banks' incentives to issue equity, and therefore examine a sub-sample of SEOs by banks that were not involved in any mergers or acquisitions during the

[10] The results are similar using a "distance to failure" measure that is based on the structural default model of Merton (1974).
[11] With so many pre-FDICIA issues being undercapitalized by this standard, it is not feasible to perform comparisons across the issuer types in that period using this norm.

four years centered on the SEO announcement year. There are 30 such undercapitalized issues and 98 well-capitalized issues. The average announcement period abnormal returns of both undercapitalized-bank issues and well-capitalized-bank issues continue to be significantly negative (*CAR (-1, 0)*: -0.70 percent versus -0.75 percent; *CAR (0,+1)*: -1.75 versus -1.47 percent, respectively). Both extensions to our tests show that seemingly-induced and more-discretionary SEOs are met with similar market reactions and have similar information content.

In conclusion, we have examined announcement period abnormal returns for the full sample period and the pre-FDICIA sample period, using several event windows and defining undercapitalized and well-capitalized bank issuers in several different ways. In each case, the announcement period stock price reaction is significantly negative for both undercapitalized and well-capitalized bank issuers. Interpreting abnormal returns as the resolution of asymmetric information via the SEO announcement, it appears the information is negatively valued and similar across the capital adequacy groups. The results are an initial suggestion that we should not distinguish between undercapitalized and well-capitalized issuances in terms of opacity or regulatory coercion. The negative abnormal returns may be due to investor reaction to opportunistic timing of these SEOs, which is the issue we examine next.

4. Evidence on SEO Timing

In this section, we provide evidence regarding the timing of bank SEO announcements. Overall, the evidence shows that both undercapitalized and overcapitalized offers are timed strategically.

4.1. Pre-Announcement Period Abnormal Stock Returns

To begin, we document the pre-announcement run-up in issuer stock price. Issuing after a price run-up is one sign of timing. For the full sample, including both undercapitalized and well-capitalized issuers, the mean abnormal pre-announcement stock price run-up as measured by *CAR(-60,-4)* is significantly positive at 4.77%. In Table 4 we report more detail, documenting a significant positive stock price run-up for both well-capitalized and undercapitalized offers. A run-up is present in both the full sample period and the pre-FDICIA period. The mean difference in stock price run-up between undercapitalized and well-capitalized offers is statistically insignificant by parametric tests. Wilcoxon rank-sum tests indicate that the run-up before undercapitalized issue announcements is actually significantly *larger* than that before the well-capitalized issue announcements for the full sample. Thus, both types of bank issuers appear to time their SEOs after a stock price run-up, suggesting similar discretion for both, and, if anything, the undercapitalized sample displays a stronger tendency to issue after a run-up.

In unreported results available on request, we document a series of robustness checks based on alternate categorizations of well-capitalized versus undercapitalized issuers, analogous to our procedure

for announcement period returns. Conclusions regarding pre-announcement run-ups are robust to the various alternative categorizations. For three of the categorizations, Wilcoxon rank sum tests indicates that the stock-price run-up before undercapitalized issue announcements is significantly larger than that before well-capitalized issue announcements. The exception is that the difference is not significant for the smaller samples of extremely over- and undercapitalized banks.

4.2. The Link between Pre-announcement Run-up and Announcement Period Market Reaction

In light of the above evidence, we hypothesize that issuers who time SEO announcements to follow a stock price run-up are especially likely to experience a significantly negative announcement period stock price correction from rational investors. This would, in turn, suggest that undercapitalized issues that are *not* announced immediately after a stock price run-up are the ones that have low information content as a result of issuance due to regulatory duress. To investigate, we segregate undercapitalized offers into those with positive pre-announcement period run-up and those without. In the full (pre-FDICIA) sample, there are 50 (40) undercapitalized-bank issuers that announced SEOs following a positive pre-announcement abnormal return, and 23 (18) that did not.

Panel A (Panel B) of Table 5 reports that for the full (pre-FDICIA) sample of undercapitalized offers after a price run-up, the mean announcement period abnormal stock price reaction is significantly negative, but for undercapitalized offers after a price run-down (i.e., non-positive run-up), the mean reaction is insignificantly different from zero. The mean difference is statistically significant. Results hold for several specifications of the announcement window. The evidence is thus that announcement period reaction takes into account perceived market timing. There is a subset of offers that the evidence points to as being under regulatory duress, but it corresponds to run-ups, not undercapitalized offers *per se*.

To control for extraneous effects, we next examine the relation between the announcement reaction and pre-announcement run-up in a regression setting. We estimate the following regression specification:

$$\begin{aligned} CAR(-1,+1) = {} & \beta_1 \, Shumway\ Measure \\ & + \beta_2 CAR(-60,-4) + \beta_3 \, Overcapitalization\ (or\ Undercapitialization) \\ & + \beta_4 \ln(Relative\ Issue\ Size) + \beta_5 \ln(Assets) \\ & + \beta_6 \, Underwriter\ Reputation + \beta_7 \, Nasdaq + \varepsilon. \end{aligned} \tag{1}$$

We also include a vector of year fixed effects in the above specification. *Shumway Measure* is the same Shumway (2001) measure of bankruptcy probability used above. Other regressors are as previously defined, and are included as control variables based on previous SEO studies.[12] The *Shumway Measure* is an important control variable because an equity influx for a financially distressed firm adds a margin of

[12] In view of the possibility that a general index of underwriter prestige might not represent the influence of underwriter prestige for bank issues, we also use an alternative version of *Underwriter Reputation*, measured as the dollar-value market share of the lead underwriter in bank SEOs announced in the year prior to each sample SEO announcement. The results are qualitatively similar.

safety for debt claimants and thus represents a transfer of value from equity (Merton, 1974). Firms with a larger bankruptcy probability may thus be more inclined to issue equity after the temporary good times reflected in a price run-up. Considering this correlation, the *Shumway Measure* regressor alleviates an omitted variable bias: our univariate results above might simply reflect that firms near bankruptcy tend to have both large run-ups and negative announcement period reactions due to the transfer, even without there being a more fundamental overvaluation signal in the announcement. Based on this reasoning, the Shumway Measure would have a significantly negative coefficient in our regression. If so, and if the omitted variable bias is the reason for our univariate findings, then *CAR (-60,-4)* would have a zero coefficient. If, on the other hand, the univariate results are economically valid, then *CAR (-60,-4)* would have a significant negative coefficient.

As usual, we perform the analysis for the full sample as well as the pre-FDICIA sample. Though these hypotheses are most interesting for the case of undercapitalized issues, where there is reason to wonder about the lack of timing discretion, we also provide comparison results for well-capitalized issues.[13]

Panel C of Table 5 shows that the *Shumway Measure* of bankruptcy probability is not significantly associated with the announcement period abnormal return for any sample or time period. Moreover, the announcement reaction is negatively and significantly associated with the pre-announcement run-up for undercapitalized-bank issuers in both the full and pre-FDICIA time period. Thus, the main conclusion from the univariate test stands. For well-capitalized issuers, the estimated coefficient on *CAR(-60, -4)* is negative and significant in the pre-FDICIA sample period, and nearly significant in the full period. We conduct a joint *F*-test to determine whether the regression coefficients of *Shumway Measure* and pre-announcement-period run-up for the undercapitalized-bank issues are significantly different from those of well-capitalized-bank issues in either period, and find that they are not. This result suggests further that undercapitalized issues are not economically different from well-capitalized issues in terms of timing effects on valuation.

4.3. Insider Stock Sales before Issue Announcement

Though the associations between announcement returns and pre-announcement run-up documented above suggest timing opportunism, they are indirect indicators. Karpoff and Lee (1991), Kahle (2000) and Jenter (2005) provide evidence of insider selling prior to equity issuance as directly indicative of managerial opportunism. Following their lead, we examine insider trading in the quarter before SEO announcements. We posit that insider selling before announcements suggests that managers believe that

[13] An influx of new equity capital into a well-capitalized bank, for example, might not entail a noticeable wealth transfer to debtholders if their interests are already safe.

share price will fall later. Further, we posit that a comparable degree of insider selling for under- and well-capitalized offers suggest a comparable degree of opportunism across those classes. Insider trading provides evidence of issue timing based on managerial opportunism that is separate from and complements the abnormal returns evidence.

Our insider trading data is from the Thomson Financial's Insider Filings database. We examine trades by company executives, officers, directors, and controlling persons, both in the open market and in private transactions. Following Seyhun (1986), we delete duplicate and inconsistent transactions, and those involving less than 100 shares. Following the literature, we examine net sales, defined as sales minus purchases (e.g., Kahle, 2000) alternatively in terms of the number of shares, dollar value, and as a proportion of total insider ownership, measured as of quarter-end prior to the SEO announcement.

Panel A (Panel B) of Table 6 reports the results for the full sample period (pre-FDICIA period). In both panels, all three measures of net sales are significantly positive for both well-capitalized and undercapitalized offers. Further, although net sales are greater for well-capitalized offers, the difference from undercapitalized offers is not statistically significant. The evidence indicates managerial opportunism, reflective of timing, that is similar across undercapitalized versus well-capitalized issues.[14] We consider the insider selling results to be consistent with Myers and Majluf (1984) and Lucas and MacDonald (1990) models. Though insider selling prior to issue is not directly treated in those models, it is to be expected if managers expect adverse developments in the stock price.

4.4. More Evidence on Regulatory Duress

Cornett and Tehranian (1994) regard undercapitalized issues as involuntary, due to regulatory duress. So far, we have uncovered evidence that both undercapitalized and well-capitalized issues have significant and similar degrees of timing discretion. To provide additional direct evidence on discretion, we next examine the capital ratios of the undercapitalized-bank issuers at the end of each quarter during the two years prior to the announcement date. We find that all but two of the undercapitalized-bank issuers in our sample are undercapitalized at each one of these earlier quarter-ends. This finding suggests undercapitalized banks are given considerable time to shore up their capital ratios.[15]

To comply with regulatory imperatives, undercapitalized banks might use alternate methods to repair their capital adequacy, such as restricting asset growth in risky asset classes (Haubrich and Wachtel, 1993), or by reducing the growth of their overall balance sheets (Bernanke and Lown, 1991), or by

[14] We also examine insider net sales in the fourth quarter after the SEO because Gombala, Lee and Liu (1997) show that insiders continue to sell through much of the post-SEO year. We find (not reported in the table) that although insiders are still net sellers in the fourth quarter after the SEO, the mean insider net sales, both in shares and dollar terms, is significantly less than in the quarter immediately prior to the SEO, for both well-capitalized and undercapitalized offers.

[15] Consistent with this, in private discussions, bank regulatory staff have told us that undercapitalized banks are given sufficient time to become adequately capitalized through using other methods.

retaining a larger fraction of their earnings.[16] The data shows the tracks of some of these alternative methods in dividend payout ratios and assets. Our undercapitalized issuer sample displays lower mean and median pre-announcement dividend payout ratios as compared to subsequent periods. Specifically, the mean (median) dividend payout ratio for the three years before issue announcement is significantly lower at 24% (18%), as compared to 39% (37%) for the three years post-SEO. In contrast, the mean (median) pre-announcement dividend payout ratio for well-capitalized banks is 61% (39%), which is not significantly different from the post-SEO mean (median) at 54% (43%). The mean (median) total assets of undercapitalized issuers for the three years before issue announcement is significantly less, at $6.8 billion ($7 billion), as compared to $11.4 billion ($11.2 billion) for the three years post-SEO.

The evidence above suggests that the undercapitalized issuers try to shore up their capitalization through lower dividend payouts and lower asset growth prior to making the SEO.[17] However, on average, they remain undercapitalized at least until a stock run-up and SEO. Then, every one of the undercapitalized issuers in our sample becomes adequately capitalized or well-capitalized within a year of the SEO. The mean (median) extent of undercapitalization a year before the issue announcement is 1.01% (0.86%), whereas by the end of the first and second years post-SEO, the extent of overcapitalization is 1.43% (1.17%), and 1.48% (1.14%), respectively. Taken in conjunction with Table 2 (which shows that the extent of undercapitalization of undercapitalized issuers is on average lower than the extent of overcapitalization of well-capitalized issuers), this indicates that the undercapitalized issuers are, on average, not extensively undercapitalized at the time of issue announcements, in that the SEOs help them become adequately or even over-capitalized.

4.5. Bank SEO Issuance Decisions

The picture that emerges from our analysis so far is that undercapitalized banks use other means to meet requirements when feasible, then resort to an SEO if they still need equity capital and mainly when a timing opportunity presents itself. To conclude this section, we further substantiate that picture with direct evidence on issuance decisions.

We construct a panel over 1983-2005 of all listed banks/quarters for which we can find data on stock returns, market-to-book ratio (*M/B*), *Overcapitalization (or Undercapitalization)*, and *Assets* at the quarter end. This sample includes not only our undercapitalized-bank and well-capitalized-bank SEO issuers, but

[16] For example, a bank could sell its mortgage portfolio and replace it with mortgage-backed securities. This arrangement reduces a bank's credit risk exposure and cuts its capital charge by more than half (four cents for every dollar in mortgages versus 1.6 cents for every dollar in Government Sponsored Enterprise-backed Mortgage Backed Securities). Credit card receipts could also be securitized and removed from the balance sheet to keep asset growth in check; this approach became popular among credit card lenders after the passage of Competitive Equality Banking Act of 1987.

[17] The evidence also suggests that the influx of equity *because of* the SEO makes it possible for these banks to pay out more by way of dividends and to grow their assets.

also non-issuers of various capital adequacy levels. The final panel has 1332 undercapitalized bank-quarters and 14,805 well-capitalized bank-quarters, of which, respectively, 959 and 4,651 bank-quarters are for undercapitalized and well-capitalized banks in the pre-FDICIA period.

We begin by comparing undercapitalized banks that issue stock versus those that do not. The mean (median) *Undercapitalization* for undercapitalized non-issuers at 1.04% (0.80%) is not significantly different from that of undercapitalized issuers: 0.99% (0.80%). The mean (median) market-to-book ratio is, however, significantly smaller for undercapitalized non-issuers at 0.52 (0.46) as compared to undercapitalized issuers at 1.49 (1.15). The undercapitalized issuers thus appear to have stronger stock valuations compared to the non-issuers. This dovetails with the earlier evidence that undercapitalized issuers issue equity when the opportunity is more attractive after a stock-price run-up. For well-capitalized banks, the mean (median) overcapitalization of non-issuers is significantly larger than that of the well-capitalized issuers: 9.48% (3.40%) versus 3.34% (2.46%). The mean (median) market-to-book ratio does not differ significantly across well-capitalized non-issuers versus issuers: 1.10% (0.99%) versus 1.49% (1.29%).

To assess how capitalization levels relate to issuance decisions, we estimate the following logit regression specification separately for the well-capitalized and undercapitalized bank panels:

$$\begin{aligned} Issue_{i,t} = {} & \beta_1 M/B_{i,t-1} + \beta_2 Overcapitalization\ (or\ Undercapitalization)_{i,t-1} \\ & + \beta_3 M/B_{i,t-1} \times Overcapitalization\ (or\ Undercapitalization)_{i,t-1} \\ & + \beta_4 ln(Assets_{i,t-1}) + e_{i,t} \ , \end{aligned} \tag{2}$$

where $Issue_{i,t}$ is an indicator variable registering whether bank *i* announces an SEO in quarter *t*, and other variables are as previously defined. We report coefficient estimates and associated *t*-statistics based on standard errors robust to heteroskedasticity and clustering by bank, following Petersen (2008).[18] We include year fixed effects in our regressions, as the residuals for a given year might otherwise be correlated across different banks.

The regression results, presented in Table 7, reveal that *M/B* is significantly and positively associated with SEOs for both undercapitalized and well-capitalized banks, and in both the full sample and pre-FDICIA sample periods.[19] This indicates that bank SEOs are more likely when the market's estimate of the value of the future growth options of the bank is favorable. Both *Overcapitalization* and *Overcapitalization* × *M/B* are significantly negatively associated with bank SEOs for well-capitalized banks in the full sample period. Thus, we find that excess capitalization is associated with a reduced likelihood of issuance even if valuations are strong. In contrast, for undercapitalized banks, neither

[18] We have also estimated this model using a Fama-Macbeth procedure, both using logit regressions and using a linear probability model. The inferences are similar to what we report in this section.

[19] Adding firm fixed effects to the model does not alter the conclusion that market-to-book is a significant determinant of SEO announcements, adding to the conclusion that time series effects, i.e., timing, are important. The effect of market-to-book is especially strong in the undercapitalized samples when firm fixed effects are included.

Undercapitalization nor *Undercapitalization* × *M/B* is significantly associated with the decision to issue. These issuance decision findings fit with our previous results to confirm that undercapitalized banks are induced to issue if valuations are attractive, but do not provide any strong indications that regulatory duress removes the timing flexibility. The conclusion holds both for the full sample and the pre-FDICIA sample period: FDICIA does not seem to have altered these issuance incentives in a measurable way.

5. Long-Run Post-SEO Performance

Spiess and Affleck-Graves (1995) and Loughran and Ritter (1997), among others, provide evidence that non-bank SEO issuers subsequently underperform long-run benchmarks. If the same is true for bank issuers, it would be evidence that banks are at least similarly opaque to other firms. Thus our focus on the extent of opacity surrounding bank SEOs is one motivation for an investigation of long-run performance. Cornett, Mehran and Tehranian (1998) propose an additional motivation in that the value implications of SEOs by undercapitalized banks might be better understood by stock market investors relative to those by well-capitalized banks, leading to less severe long-run underperformance for undercapitalized issuers. This section reports an investigation of long-run performance following SEOs that addresses these topics.

5.1. Methodology

Measurement of long-run performance involves many statistical difficulties, as discussed by Barber and Lyon (1996, 1997), Fama (1998), Lyon, Barber and Tsai (1999), and many others. Further, some standard methodologies work less well in industry-clustered samples (Lyon, Barber and Tsai (1999)), as is the case for our bank sample. We therefore apply a battery of methods to test long-run performance, guided by this literature, with particular attention to industry-clustering. Our methods fall in three broad categories: calendar-time abnormal returns, buy-and-hold abnormal returns, and operating performance measures.

*Calendar time abnormal returns (CTAR) methodology. CTAR*s are one widely-used measure of long-run stock performance. A *CTAR* is essentially the Jensen's alpha from a monthly time-series factor model applied to a portfolio of event stocks. Fama (1998) advocates *CTAR* because monthly returns are less affected by "bad model" problems than the compounded returns used in other methods, and because portfolio returns automatically take account of stocks' cross-correlations.

Our use of *CTAR* methods provides comparability to other SEO studies. Krishnamurthy, Spindt, Subramaniam, and Woidtke (2005), Lyandres, Sun, and Zhang (2005), and D'Mello, Schlingemann, and Subramaniam (2005) all examine calendar-time abnormal returns for the three years following SEOs. We follow these papers in looking at a three year post-SEO period. *CTAR* methods are especially appropriate

given that our bank sample is, by definition, subject to severe industry clustering. Lyon, Barber and Tsai (1999), in their comprehensive evaluation of the size and power of various tests of long-run abnormal stock performance, present evidence that *CTAR*s provide more valid inference under conditions of severe industry clustering for one and three year post-event periods than do other leading methods.[20]

Following Fama and French (1992, 1993) and Carhart (1997), we alternatively benchmark against a three or four factor model. The three factor model includes *RM*, the excess return value-weighted CRSP market index relative to the one month Treasury Bill return; *SMB*, the return on a zero investment portfolio that is long large-cap stocks and short small-cap stocks; and *HML*, the return on a zero investment portfolio that is long high book-to-market stocks and short low book-to-market stocks. The four factor model adds a momentum factor.[21] The 3-factor and 4-factor *CTARs*, denoted respectively as α^3 and α^4, are then the intercepts of the regression models

$$\begin{aligned} r_{pt} &= \alpha^3 + b \times RM_t + s \times SMB_t + h \times HML_t + \zeta_t, \\ r_{pt} &= \alpha^4 + b \times RM_t + s \times SMB_t + h \times HML_t + u \times UMD_t + \upsilon_t, \end{aligned} \qquad (3)$$

where r_{pt} is the month-t excess return for the equally-weighted portfolio of all recent SEO announcers within n months prior to month t from one of our focal subsamples (i.e., formed according to the mix of undercapitalized, well-capitalized, full sample period and pre-FDICIA sample period designations), where n is 12, 24, or 36 depending on the holding period being studied. The portfolio is updated every month to buy new recent issuers and sell issuers that are no longer recent. As in Lyon, Barber and Tsai (1999), if there are no firms in the portfolio in a particular calendar month, then that month is dropped. The regression is estimated by ordinary least squares with heteroskedasticity-corrected t-statistics to access statistical significance. Given this setup, *CTAR*s should be interpreted as abnormal returns on a per-month basis.

Buy-and-hold abnormal returns (BHAR) methodology. *BHAR*s are the most commonly-computed measures of long-run abnormal performance. The idea is to compare the compounded holding period return of sample event stocks to that of some reference stock or portfolio, and base inferences on the difference. The reference stock or portfolio benchmarks for normal returns on a particular stock, and the difference in holding period returns is the *BHAR*. Spiess and Affleck-Graves (1995), Lee (1997), and Clarke, Dunbar, and Kahle (2001), among others, examine three year post-SEO *BHAR*s of various types

[20] For example, in their Table X, they report evidence that, as compared to any of the standard buy-and-hold abnormal returns methods reported in their Table VII, any of their *CTAR* methods over-reject a true null hypothesis to a lesser extent for the three year case. The comparison is nearly as categorical for the one year case.

[21] We obtain the necessary factor returns as well as the one-month Treasury bill rate from Professor Ken French's web site at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

for non-bank samples, while Cornett, Mehran, and Tehranian (1998) do the same for a bank SEO sample. Like these studies, we focus on post-SEO holding periods of three years or less.

We compute *BHAR*s in several alternative ways, for robustness. They differ essentially in the nature of the reference portfolio. First, considering the industry-clustered nature of our sample, we compute *BHAR*s using industry-and-size matched reference portfolios, similar to Spiess and Affleck-Graves (1995). Reference portfolio stocks must belong to the banking industry SIC codes specified in Professor Ken French's web site, must have either an exchange listing or a common stock code in CRSP, and must have entered the Compustat database at least two years before the SEO announcement. Each issuer/event is matched to an industry-wide size quintile portfolio (excluding our sample stocks), assessed as of the end of the year prior to the announcement date. This becomes the issuer/event's reference portfolio, and we use its equally-weighted return in computing the *BHAR*. No new firms are allowed to enter the reference portfolio over time. If any reference stock leaves the sample before three years after the SEO announcement, the proceeds are assumed to be equally invested in the other reference stocks. If our sample bank is delisted before three years, subsequent abnormal returns are set to zero. An equally-weighted reference return is similar to the concept of Cornett, Mehran and Tehranian (1998), but is possibly subject to rebalancing biases (Barber and Lyon, 1996). Therefore, we also compute a buy-and-hold return version in which the originally-equal-weighted portfolio is held without rebalancing.

Second, because reference portfolios based on market-wide stock characteristic matches to stocks in an event sample are standard in the literature, we also compute *BHAR*s on that basis. We follow the procedure in Lyon, Barber and Tsai (1999). To summarize briefly, working from Monthly CRSP and Compustat databases, we measure market-value-of-equity, book-to-market and momentum characteristics that we use in constructing 125 equally-weighted reference portfolios at each point in time, based on the market-wide quintile breakpoints of the three characteristics. Each sample SEO event is matched to one of the reference portfolios based on the issuer's characteristics as of the June-end prior to the announcement. We exclude SEO stocks from the reference portfolios. Reference portfolio stocks must have entered the Compustat database at least two years before SEO announcement to guard against biases associated with new listings. The identity of reference portfolio stocks is held fixed over the three year horizon, even though their characteristics may change. In computing *BHAR*s, we alternatively compound the return on a reference portfolio that retains equal weights over time and one that simply holds the original shares.

We are able to compute both (a) industry-and-size matched *BHAR*s and (b) size, book-to-market and momentum matched *BHAR*s for at least one holding specific period (i.e., one, two, or three years) following 240 SEO events. For the remaining 36 SEO events, we could not set reference portfolios under the second method due to data requirements. For some of these 240 events, the available CRSP dataset as

of the time of our work ends before the longest *BHAR* horizon does. We cannot compute 23 *BHARs* for a three year holding period and 13 *BHAR*s for a two year holding period because of this constraint.

To summarize long-run returns for these multiple holding periods of interest, we are faced with a choice on sample-size protocols. We can fix the relevant sample as the one for which we can compute three year post-SEO *BHAR*, then use the same sample to characterize one and two year *BHAR*s. This facilitates comparisons of performance over time because the sample of issuers is fixed, but the analysis becomes subject to survivorship bias. Alternatively, we can adjust the sample size as we examine the one, two, and three year *BHAR*s. This avoids survivorship bias, but makes comparisons of *BHAR*s for different holding periods harder to interpret. As a solution, we examine results for sample sizes that are determined both ways: a "constant sample" for which we can compute all *BHAR*s up to a three year horizon, and the several "maximum samples" for which we can compute the one, two, and three year *BHARs* respectively.

For each alternative *BHAR* method, holding period length and sample-size protocol, we compute skewness-adjusted *t*-statistics for the *BHAR*s and compare them to bootstrapped critical values to assess significance, following the procedure in Lyon, Barber and Tsai (1999). Specifically, we randomly draw 1,000 samples of size *n/4* from an original sample of *n BHAR*s. We then compute 1,000 *t*-statistics under the null hypothesis and obtain critical values by examining this empirical distribution (see equation (6) in Lyon, Barber and Tsai, 1999). For the size, book-to-market and momentum matched *BHAR*s, we alternatively obtain inferences using the pseudo-portfolio method described in Barber, Lyon and Tsai.

Abnormal operating performance methodology. To complement results on post-SEO long-run stock returns, we examine four measures of long-run operating performance: the ratio of net income to total assets (*ROA*), the difference between interest income and interest expense scaled by earning assets (*Net Interest Margin*), the ratio of operating income to earning assets (*Operating Income Ratio*), and the ratio of net income to revenues (*Profit Margin*), all calculated from call reports and Y-9 statements. Each of these is measured net of the performance of a matched sample of non-issuers using the methodology of Barber and Lyon (1996), as modified suitably for banks. Specifically, for each sample event, we begin with a list of all non-issuing banks as of the end of the preceding year, defined as banks in our data that do not have an SEO in either the preceding five years or the succeeding five years. Then, considering that the real estate loan ratio influence both bank size and profitability (see, for example, Owens, 1994, and Gavin and Hausmann, 1998), we screen for banks that have a ratio of real estate loans to assets within 40% to 160% of the issuer's in the pre-announcement year. The resulting list defines candidates for our matched non-issuers. Still following Barber and Lyon, we impose two final filters to determine the final set of matches: the book value of assets of each matched bank must fall within 70% to 130% of the issuer's in the pre-announcement year, and the return on assets must fall within 90% to 110% of issuer's

in the pre-announcement year.[22] Finally, we, we compute match-adjusted performance measure by subtracting the median performance measure of each matched non-issuer from the issuer's performance measure, and winsorize the distribution at the 1 percent and 99 percent levels.

5.2 Long-run Abnormal Stock Returns Results.

Table 8 summarizes key results of our examination of long-run abnormal stock performance. For brevity, these panels report on a subset of our methods considering validity under industry clustering and comparability to other relevant studies. Panel A reports on CTARs, and Panel B reports on industry-matched *BHAR*s with an equally-weighted reference portfolio. Numerical results under our other methods are available from the authors in an unpublished table. Those results are generally consistent with those reported in detail here, except as discussed below.

Panel A of Table 8 splits out estimates of three and four factor *CTARs* for well-capitalized and undercapitalized issuers, for both the full sample period and the pre-FDICIA sample period. The three year post-SEO *CTAR*s are insignificantly different from zero for both well-capitalized and undercapitalized issuers over both sample periods. There is some evidence of a pattern of temporary bounce-back in the immediate post-SEO period for well-capitalized issuers in the full sample, in that *CTAR*s are weakly significantly positive for the first and second years post-SEO. Overall, the *CTAR* results do not suggest any long-run underperformance following bank SEOs nor do they suggest a difference in post-SEO performance across undercapitalized versus well-capitalized banks.

Panel B of Table 8 provides evidence on *BHAR* using the industry-and-size matched equal-weighted reference portfolios. Three points deserve discussion. First, mean one, two and three year *BHAR*s are insignificantly different from zero for both undercapitalized issuers and well-capitalized issuers in both the full sample period and in the pre-FDICIA sample period. In results not reported in the table, we obtain the same qualitative results of no abnormal performance using size-matched bank reference portfolios that hold the original shares without rebalancing, except that there is weakly significant evidence of positive three-year abnormal performance for undercapitalized issuers. Results using size, book-to-market and momentum matched reference portfolios similarly do not suggest any significant difference between undercapitalized and well-capitalized issuers. They do show a tendency for positive abnormal returns for the undercapitalized issuers. This tendency is more marked when the original reference portfolio is held without rebalancing. Under that method, bootstrapped skewness adjusted *t*-statistics lead to a conclusion that some years' abnormal returns are significantly positive, although inferences based on empirical *p*-values from pseudo-portfolio methodology are somewhat less strong. Second, even though not

[22] The number of matched banks for each issuer varies from one matched non-issuing bank for ten issuers to 320 matched non–issuing banks for five issuers. For a majority of 123 issuers, however, the number of matched non-issuing banks ranges from five to twenty. Barber and Lyon (1996) also allow the number of matched firms to vary.

statistically significant, the implied pattern of bounce-back of returns in the immediate post-SEO period is similar to that reported in Spiess and Affleck-Graves (1995) for non-bank SEOs. Third, regarding our central comparison of SEO types, long-run abnormal returns are not significantly different for undercapitalized issuers versus well-capitalized issuers.

Our evidence for bank SEOs is contrary to the underperformance documented for non-bank firms. Spiess and Affleck-Graves (1995) and Lee (1997), for example, report significantly negative mean three year *BHAR*s worse than –20 percent, while Krishnamurthy, Spindt, Subramaniam, and Woidtke (2005) and D'Mello, Schlingemann, and Subramaniam (2005) report significantly negative three year *CTAR*s worse than –0.30 percent per month.[23] Judging from this evidence, bank SEOs seem less opaque than other SEOs, in that stock valuations seem appropriate for the long run immediately after the event.

As a check of the economic significance of long-run returns, we examine separately banks that have greater than $1 billion in total assets at the end of the quarter before the issue announcement ("big issuers") and issue sizes that are greater than 1% of the total assets of a bank ("big issues"). Although, in general, big issuers have worse post-SEO abnormal stock returns than small issuers, three year post-SEO abnormal stock returns measured alternatively three or four factor *CTAR* are insignificantly different from zero for both big and small issuers in the well-capitalized and undercapitalized sub-samples.

A related statistical concern for *BHAR*s is that repeated SEO announcements by the same issuer could possibly induce cross-sectional dependence resulting from overlapping periods of returns for the same firm. Hence, we re-compute our one, two and three-year *BHAR* after dropping all repeat issues from our sample. Using industry-focused reference portfolios for this restricted sample, all mean *BHAR*s are insignificantly different from zero. Using the market-wide reference portfolios, the mean first year *BHAR* is significantly positive for both well-capitalized issuers and undercapitalized issuers in the full sample, while the two and three year mean *BHARs* are insignificantly different from zero for both types of issues. Mean one, two and three year *BHARs* are all insignificantly different from zero for both types of issuers.

5.3 Abnormal Operating Performance Results

Table 9 reports results of our abnormal operating performance investigation. Panel A has results for the full three-year post-SEO period, while Panel B reports year-by-year results. A key question is whether issuers underperform their matched banks. Of the four match-adjusted measures, only one (*Profit Margin*)

[23] Eckbo, Masulis and Norli (2007), in their survey article that compares all types of securities issuances, also compute and report *BHAR* and 3-factor *CTAR* of over 5 years post issue that are insignificantly different from zero for banks and financial firm SEOs made over the 1980-2000 period.

is consistently significantly negative for all the subsamples.[24] In no case does the comparison of undercapitalized to well-capitalized issuers yield a significant difference. For example, match-adjusted *ROA* is significantly negative for the well-capitalized issuers in the full sample, but it is negative for the undercapitalized issuers as well and the difference is not significant.[25]

Panel B of Table 9 shows that match-adjusted operating performance tends to deteriorate year-by-year post-SEO. For undercapitalized issuers, the mean *ROA* is significantly positive in the first year and insignificantly different from zero in the third year, while the mean *Profit Margin* is insignificantly different from zero in the first year and significantly negative in the third year. Similarly, for the full sample of well-capitalized issuers, the mean *ROA* and *Profit Margin* are both insignificantly different from zero in the first year and significantly negative in the third year; the pattern is similar but less strong for the pre-FDICIA sample period. Considering the announcement period evidence presented earlier, stock market investors appear to anticipate such poor performance at the time of the SEO.

Comparing across issuer types, mean match-adjusted *ROA* is significantly larger for undercapitalized issuers in the first and second years post-SEO (although the numbers are economically small), and *Profit Margin* is significantly larger for undercapitalized-bank issuers in the second year. In the third year, only the mean *Operating Income Ratio* is significantly different between the well-capitalized-bank and undercapitalized-bank offers; the mean *Profit Margin* for both types of issuers and the mean *ROA* for well-capitalized issuers are significantly negative, and these measures are not significantly different between the well-capitalized and undercapitalized issuers. For the pre-FDICIA sample period, none of the four measures of post-SEO performance measures is significantly different for well-capitalized issuers as compared to the undercapitalized issuers.

6. Robustness Checks and Comparison with Previous Studies

6.1 Announcement Period Abnormal Returns

The announcement period abnormal returns to undercapitalized SEOs reported in this study for the pre-FDICIA period differ from results reported in Cornett and Tehranian (1994) for a similar period (June 1983-December 1989). We find similar and significantly negative announcement period abnormal returns for both undercapitalized and well-capitalized bank issuers, with the mean difference being insignificantly different from zero. In contrast, for their sample of undercapitalized offers, Cornett and Tehranian report a

[24] Our numbers are in the ball-park of numbers reported previously. Cornett, Mehran and Tehranian (1998) report match-adjusted *ROA* of -0.78% for well-capitalized-bank issues and 0.13% for undercapitalized-bank issues over the 3-year post-SEO period, while Cornett, McNutt and Tehranian (2006) consider banks that merge and report a pre-merger match-adjusted ROA of -0.10% and match-adjusted *Net Interest Margin* of 0.07%. For industrial SEOs, Loughran and Ritter (1997) report 3-year post-SEO match-adjusted *ROA* of -1.3% and match-adjusted *Profit Margin* of -0.7%.

[25] Cornett, Mehran and Tehranian (1998) also find that the long-run post-SEO match-adjusted *ROA* is significantly negative for well-capitalized-bank issuers.

mean *CAR(-1,0)* of -0.64 percent, which is not significantly different from zero. For their well-capitalized offers, they also report a significantly negative mean *CAR(-1,0)* of -1.56 percent. The mean difference between the two types is statistically significant. There are two main possibilities for this discrepancy. One is differences in sample composition. The other is differences in empirical methodology. We address each of these possibilities next.

Although the Cornett and Tehranian (1994) database is no longer available, we use many of the same sampling norms as do Cornett and Tehranian.[26] However, there are some procedural differences as well. For example, both studies define the regulatory capital requirement for their overlapping sample periods in terms of a total capital ratio of seven percent. However, the calculations differ because we follow the regulatory standards from the Federal Register for the calculations (see the Appendix for detail) in order to best identify banks that might be under regulatory duress, and, in particular, because we use the average of total assets over the pre-announcement year as the capital-ratio denominator (Cornet and Tehranian use end-of-year assets), and because we adjust total assets for loan and lease losses (Cornett and Tehranian do not use this adjustment). A second procedural difference is that the Cornett and Tehranian sample is collected from the Investment Dealer's Digest (IDD). Our initial sample comes from the SDC Platinum database, which is now the standard source for such data. To minimize differences, we have cross-checked our issuance dates against IDD for offers made in the pre-FDICIA sample period.

Comparing the two samples, we have roughly the same number of well-capitalized and undercapitalized bank offers in our pre-FDICIA period that Cornett and Tehranian have in their sample: we have one less undercapitalized-bank offer, but four more well-capitalized-bank offers. The year-by-year pattern of SEOs is not available from the Cornett and Tehranian article. There is a year-by-year breakout in the later Cornett, Mehan and Tehranian (1998) study of long-run performance, which uses a related sample to that in the Cornet and Tehranian (1994) study (i.e., similar collection protocols and overlapping sample periods), though the overlapping year components of those samples cannot be exactly the same given the published sample and subsample counts. The year-by-year pattern of our pre-FDICIA sample is clearly different than that for the overlapping years in the Cornett, Mehran and Tehranian study.

As to methodology, Cornett and Tehranian (1994) compute announcement abnormal returns from a market model including market returns at two leads and two lags in addition to the contemporaneous return to compensate for the effects of non-synchronous trading, as do we here. However, the parameters of their market model are estimated from 21 days through 120 days in the post-announcement period, which is somewhat different than ours. They use the equally-weighted CRSP index return as the market proxy rather than the now more widely used value-weighted CRSP index return we employ.

[26] We have inquired of the authors for their sample, and have been informed that it is not available due to the long period of time since it was collected.

For comparison purposes, we adjust our methodology to follow Cornett and Tehranian (1994) as closely as possible and report on the announcement period abnormal returns for comparable windows in Panel A of Table 10. The panel shows descriptive statistics for announcement period abnormal stock returns for undercapitalized and well-capitalized offers made in the pre-FDICIA period (matching up with the Cornett and Tehranian years), as well as in our full sample period for comparison purposes.

These methodological adjustments do not change our basic findings as reported above in Table 3.[27] The market reacts significantly negatively to *both* undercapitalized and well-capitalized offers, both the pre-FDICIA sample period and in the full sample period. Further, the announcement period market reaction is not significantly different between the two types. The Wilcoxon rank-sum test implies that, for some event windows, the distribution of announcement abnormal returns to undercapitalized offers is *more* negative than for well-capitalized offers. In fact, the magnitude of the mean announcement period abnormal returns (reported in Table 10) is more negative for undercapitalized offers as compared to the numbers reported in Table 3.

Because we can match estimation methodology closely, but cannot match the details of our sample collection procedures so many years later, sampling differences (which cannot be precisely identified in the absence of the Cornett and Tehranian sample) are the most likely source of the discrepancy. Certainly, to the extent that the Cornett and Tehranian (1994) sample is similar to the Cornett, Mehran and Tehranian (1998) sample (for which year-by-year sample composition is reported, but for which announcement period returns are not investigated in detail), our sample is different. In view of the conflicting economic findings from different samples, the conservative conclusion is that the null hypothesis of no difference between the announcement period abnormal stock returns for undercapitalized versus well-capitalized offers cannot be rejected.

6.2 Long-run Performance

In a study of long-run performance following bank SEOs, Cornett, Mehran, and Tehranian (1998) report that well-capitalized bank SEO stocks are like other SEO stocks in that they underperform their benchmarks post-SEO, while undercapitalized issuers do not. They report a mean three year post-SEO *BHAR* in their sample of -14.44 percent for well-capitalized issuers (significantly negative at the 1 percent significance level) but -0.31 percent for undercapitalized issuers (insignificantly different from zero), and the mean difference between the two groups is highly statistically significant.

[27] Because Cornett and Tehranian (1994) had one more undercapitalized offer in their sample, we also experiment by shifting the offer made by the least overcapitalized bank into the undercapitalized group, with minimal effects on the results.

There are clear differences between the methodology employed by Cornett, Mehran, and Tehranian, and the Lyon, Barber and Tsai (1999) methodology, which was only being developed around the time the Cornett, Mehran, and Tehranian paper was written, that we have implemented in a variety of ways. Cornett, Mehran and Tehranian compute *BHAR* using 125 reference portfolios based on book-to-market ratio, market value of equity, and momentum, but the reference portfolio is allowed to update (i.e., there is both annual rebalancing and changes in the stock's identities). Further, the sample of issuer stocks is not excluded from being included in the reference portfolio. In addition to the methodology differences, the other study covers 1983-1991, which is somewhat different than our pre-FDICIA period.

To investigate the influence of methodology differences, we adjust our estimation procedures to match as closely as feasible to Cornett, Mehran, and Tehranian's (1998), and summarize *BHAR*s in Panel B of Table 10. Under the adjusted methods, we find that post-SEO abnormal returns are significantly negative for the well-capitalized-bank offers and insignificantly different from zero for the undercapitalized-bank offers in the pre-FDICIA period. Thus, the adjusted results are qualitatively in line with Cornett, Mehran and Tehranian's. In fact, the mean three year *BHAR* of -14.76 percent for the well-capitalized issuers from the pre-FDICIA period is close in magnitude to that reported in Cornett, Mehran, and Tehranian. However, abnormal stock returns for one, two and three years post-SEO are all insignificantly different from zero for both types of offers in the full sample.

Overall, comparing the results of Panel B of Table 8 (and the related untabled variations that we discussed along with Table 8) with those of Panel B of Table 10, it appears that the Cornett, Mehran, and Tehranian's long-run return underperformance result for the well-capitalized bank issuers is influenced by the methodology used, and that various other statistical methods leads to a different economic conclusion: post-SEO abnormal stock returns are similar to benchmark returns for both undercapitalized and overcapitalized bank SEO issuers in the long run, suggesting that, contrary to the well-documented evidence for non-bank SEOs, investors understand the value implications of bank SEOs upon announcement. Comparing results across the array of methods, the specific source of the difference seems to be the changing identities of stocks in the reference portfolio under the older method, based on evolving size, book-to-market and momentum categorizations.

7. Conclusion

A number of papers have examined the announcement-period stock-price reaction and the subsequent post-SEO long-run stock returns for non-bank SEOs. Even though bank equity finance is a topic of central importance, banks have been under-researched in this respect. SEO studies often emphasize mispricing, timing, and the information revealed in an SEO announcement. Banks represent a useful laboratory to assess proposed explanations for SEOs and related value effects in that banking operations

are often considered as relatively opaque. Comparisons with non-bank results for bank SEO motivations, announcement effects, and long-run effects may therefore be illuminating. Also, opaqueness of bank SEOs might be low for banks that are "undercapitalized" by regulatory standards, and which therefore might be compelled to float stock. If so, stock investors may react to these SEO announcements differently from other SEO announcements.

We find a negative announcement effect on stock prices, but no evidence of negative long-run stock price performance. Our evidence is consistent with adverse selection explanations of SEO value effects, such as Myers and Majluf (1984), where the announcement resolves the information asymmetry in an unbiased fashion. Arguably, pre-SEO private information would ultimately be reflected in poor long-run operating performance of the bank making the SEO, which is just what we find, albeit the operating underperformance is weak. The insignificant post-SEO abnormal stock return in the long run is inconsistent with the results for industrial SEOs documented in the literature. Thus the market appears to understand the motives behind bank equity issuances better than those behind equity issuances made by industrial firms.

We also provide evidence from stock prices, insider trading, and issuance decisions that supports the idea of market timing, as proposed, for example, by Lucas and MacDonald (1990), in that banks wait for an attractive stock price before announcing an SEO. Our results are also consistent with Dittmar and Thakor (1997), who contend that firms are more likely to issue new equity during periods of greater agreement between the managers and shareholders; high stock price is evidence that stockholders agree with managerial decisions. Our results do not line up with reasoning such as Baker and Wurgler's (2002), which allow for irrational overvaluation to be effectively exploited and predict poor stock performance following an SEO.

With respect to the comparison of undercapitalized versus well-capitalized issuers, we find no evidence that the undercapitalized banks are under duress from the regulators to quickly raise equity. Almost all the undercapitalized banks in our sample have been undercapitalized for several years before the SEO announcement. The timing evidence is similar for both types of SEOs. Further, we document that undercapitalized issuers take other actions to shore up their regulatory compliance, such as lower dividend payouts and asset growth. Both undercapitalized and well-capitalized bank issuers experience similar significantly negative stock-price reaction upon announcement, and neither group underperforms on its benchmarked stock returns over the long-run post-SEO. Overall, the evidence presented in this paper implies that undercapitalized bank SEOs are more discretionary and that all bank SEOs are less opaque than implied by earlier studies.

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Appendix
Total capital ratio calculation for banks

Period	Tier 1	Tier 2	Asset Base	Remarks
Pre-1990	Common stock (CS)	Limited-life preferred stock (LLPS)	Average total assets	ECN in Tier 1$<$0.1667 Tier 1
	Perpetual preferred stock (PPS)	Subordinated notes and debentures (SND)	Allowance for loan and lease losses (exclusive of allocated transfer risk reserves)	LLPS and SND in Tier 2$<$ 0.5 Tier 1
	Surplus (SU)	Equity commitment notes (ECM)	Deduct Goodwill	
	Undivided profits (UP)	Deduct CS and PPS to redeem ECM		
	Contingency and other capital reserves (CR)			
	Equity contract notes (ECN) Allowance for loan and lease losses (exclusive of allocated transfer risk reserves) (ALL)			
	Minority Interest (MI)			
	Deduct Goodwill			
	Deduct CS and PPS to redeem ECN			
1990-1991	CS	ALL (restricted)	Risk-weighted assets (exclusive of ICS and RHCI)	NPPS<0.25 Tier 1
	Noncumulative PPS (NPPS)	All other PPS	Deduct ALL in excess of allowed amount in Tier 2	ALL <0.0125 Risk-weighted Assets
	SU	Long-term preferred stock (LTPS) (original maturity >20 years)	Deduct Allocated transfer risk reserves (TRR)	(SND+ITPS) < 0.5 Tier 1 net of goodwill
	UP	ECN	Deduct Goodwill	Deduct Investments in certain subsidiaries (ICS) from total capital but not from components
	CR	SND (restricted)		Deduct Reciprocal holdings of capital instruments (RHCI) of banking organizations from Total Capital BUT not from components
	MI	Maturity-weighted Intermediate-term preferred stock (ITPS) (restricted)		Tier 2 < Tier 1 net of goodwill
	Deduct Goodwill	Hybrid capital instruments (HCI)		

(Appendix continues on next page)

1992-1994	Same as 1990-1991	Same as 1990-1991	Same as 1990-1991	Same as 1990-1991 EXCEPT ALL in Tier 2< 0.0125 Risk-weighted assets
1995-1998	Same as 1992-1994 EXCEPT *Deduct* all intangible assets EXCEPT purchased mortgage servicing rights (MSR) and purchased credit card relationships (PCCR) (restricted) *Deduct* Deferred tax assets (DTA) (see remark)	Same as 1992-1994	Same as 1992-1994 EXCEPT *Deduct* All intangible assets EXCEPT MSR and PCCR *Deduct* Deferred tax assets (DTA) (see remark)	Same as 1992-1994 EXCEPT MSR + PCCR < 0.5 Tier 1 PCCR < 0.25 Tier 1 DTA to be realized in the next 12 months can be included in Tier 1 upto 10 percent of Tier 1
Post-1998	Same as 1995-1998	SAME AS 1995-1998 EXCEPT *Include* Unrealized holding gains on equity securities (UGE) (restricted)	Same as 1995-1998	Same as 1995-1998 EXCEPT Upto 45 percent of UGE may be included in Tier 2 (MSR + PCCR) in Total Capital<Tier 1 PCCR < 0.25 Tier 1

Note. This table shows year-by-year calculations of the regulatory total capital ratio for banks. Total capital ratio is defined as Tier 1 capital + Tier 2 capital divided by the Asset Base. Financial statement information is obtained from the Federal Financial Institutions Examination Council's Reports and Income and Condition (Call Reports). To calculate the total capital ratios, the formulas published by the Board of Governors of the Federal Reserve System in the Federal Register on January 1 of each year are used (Title 12 Part 208 Appendix A for commercial banks). After 1989, the capital adequacy formulas, reflecting the risk-based capital guidelines, are used

Table 1
Well-capitalized and undercapitalized bank seasoned equity offerings (SEOs)

Year	Undercapitalized issues	Well-capitalized issues	Year	Undercapitalized issues	Well-capitalized issues
1983	6	2	1995	0	6
1984	10	5	1996	0	4
1985	19	9	1997	1	5
1986	21	24	1998	1	8
1987	0	11	1999	0	3
1988	1	5	2000	1	1
1989	1	9	2001	4	2
1990	1	5	2002	2	5
1991	0	26	2003	3	4
1992	2	32	2004	0	10
1993	0	13	2005	0	13
1994	0	1	All years	73	203
			Pre-FDICIA	59	70

Note. This table shows the year-by-year distribution of SEO announcements by undercapitalized and well-capitalized banks for our sample of 276 events over 1983-2005 full sample period and over 1983-1990 Pre-FDICIA sample period. Undercapitalized and well-capitalized issues are delineated in the quarter before issue on the basis of the regulatory norm for total capital ratio prevailing in the year of the issue, as detailed in Appendix.

Table 2
Descriptive statistics for bank SEOs

	Undercapitalized issues N = 73				Well-capitalized issues N = 203			
	Mean	Median	Minimum	Maximum	Mean	Median	Minimum	Maximum
Total Capital Ratio	6.59	6.42	4.05	9.98	12.95	11.99	7.02	26.55
Undercapitalization	0.99	0.80	0.02	3.45			N/A	
Overcapitalization			N/A		3.34	2.46	0.02	14.37
Assets ($ million)	7,787	2,023	190	173,597	12,135	1,829	41	196,124
Relative Issue Size	1.38	0.98	0.06	6.36	2.03	1.28	0.08	11.27

Note. This table presents descriptive statistics for our sample of 276 bank SEO announcements, segregated into undercapitalized and well-capitalized offers based on regulatory capital adequacy requirements as applied to the issuer. Details of the norms and their application in these calculations are listed in the Appendix. *Total Capital Ratio* is the ratio of Tier1 + Tier2 capital to total assets. *Undercapitalization* is the amount of new equity capital needed to satisfy capital requirements as of the end of the quarter before the announcement, as a fraction of total assets. *Overcapitalization* is the amount by which capital exceeds requirements as of the end of the quarter before the announcement, as a fraction of total assets. *Assets* is total assets of the issuing bank at the end of the quarter before the issue announcement. *Relative Issue Size* is the ratio of gross issue proceeds from the offering exclusive of overallotment options to total assets. "N/A" denotes "Not Applicable". Numbers are percentages unless otherwise specified.

Table 3
Announcement period abnormal stock returns around bank SEO announcements

		Full sample: 1983-2005		Pre-FDICIA sample: 1983-1989	
		Undercapitalized issues	Well-capitalized issues	Undercapitalized Issues	Well-capitalized issues
Announcement Window	*N*	73	203	58	65
CAR (-1,0)	Mean	-0.81***	-0.87***	-1.13***	-1.20***
	Median	-0.74	-0.72	-1.08	-1.02
CAR (0,+1)	Mean	-1.13***	-1.35***	-1.25***	-1.69***
	Median	-1.38	-1.03	-1.33	-1.12
CAR (-1,+1)	Mean	-0.96***	-1.47***	-1.24***	-1.98***
	Median	-1.22	-1.30	-1.32	-1.34
CAR (-3,+3)	Mean	-1.27***	-1.40***	-1.38***	-2.09***
	Median	-1.79	-1.30†	-1.92	-0.84†

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level based on a Patell *z* test.
$^{+++}$, $^{++}$, $^{+}$ respectively denote that the means are significantly different for the undercapitalized and well-capitalized samples at the 1%, 5%, and 10% significance level based on the standard event-study test.
†††, ††, † respectively denote that the undercapitalized and well-capitalized sample distributions differ significantly at the 1%, 5%, and 10% significance level based on a Wilcoxon rank-sum test.

Note. This table shows descriptive statistics for market model announcement period abnormal stock returns, *CAR(i,j)*, over days *i* to date *j* relative to bank SEO announcements, segregated into undercapitalized and well-capitalized offers based on regulatory capital adequacy requirements as applied to the issuer. The market model uses value-weighted CRSP index returns at two leads and two lags in addition to the contemporaneous return. The parameters of the market model are estimated in a 250-day window beginning 25 days after the issue date.

Table 4
Pre-announcement period abnormal stock returns before bank SEO announcements

	Full sample: 1983-2005		Pre-FDICIA sample: 1983-1989	
	Undercapitalized issues	Well-capitalized issues	Undercapitalized issues	Well-capitalized issues
N	73	203	58	65
Mean	6.14***	4.28***	4.38***	5.91***
Median	5.33	2.87†	5.07	5.05

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.
+++, ++, + respectively denote that the means are significantly different for the undercapitalized and well-capitalized samples at the 1%, 5%, and 10% significance level.
†††, ††, † respectively denote that the undercapitalized and well-capitalized sample distributions differ at the 1%, 5%, and 10% significance level by the Wilcoxon rank-sum test.

Note. This table shows descriptive statistics for pre-announcement period abnormal stock returns, *CAR (-60,-4)*, from 60 days before issue announcement through 4 days before announcement date, calculated using a market model with the same specifications as for Table 3. Issues are segregated into undercapitalized and well-capitalized types based on regulatory capital adequacy requirements as applied to the issuer.

Table 5
Pre-announcement stock price run-up and announcement period abnormal returns

Panel A

	Undercapitalized issues: Full sample period	
	Negative Run-up	*Positive Run-up*
	N = 23	N = 50
Mean CAR (-1,0)	0.12	-1.24$^{***\ ++}$
Mean CAR (0,+1)	0.10	-1.69$^{***\ +++}$
Mean CAR (-1,+1)	0.60	-1.67$^{***\ +++}$

Panel B:

	Undercapitalized issues: Pre-FDICIA sample period	
	Negative Run-up	*Positive Run-up*
	N = 18	N = 40
Mean CAR (-1,0)	-0.38	-1.46$^{***\ ++}$
Mean CAR (0,+1)	-0.19	-1.72$^{***\ ++}$
Mean CAR (-1,+1)	-0.18	-1.72$^{***\ ++}$

Panel C

	Full sample period		Pre-FDICIA sample period	
	Undercapitalized issues	Well-capitalized issues	Undercapitalized issues	Well-capitalized issues
	N = 73	*N = 203*	*N = 58*	*N = 65*
Shumway Measure	-0.005	-0.005	-0.013	0.006
	(-0.35)	(-0.46)	(-0.81)	(0.29)
CAR (-60, -4)	-0.043**	-0.012	-0.053**	-0.050**
	(-2.37)	(-1.58)	(-2.32)	(-2.48)
Overcapitalization (or Undercapitalization)	1.074*	-0.015	0.934	-1.024***
	(1.82)	(-0.13)	(1.41)	(-2.94)
ln(*Relative Issue Size*)	0.008	-0.009**	0.004	-0.014
	(0.98)	(-2.23)	(0.50)	(-1.59)
ln(*Assets*)	0.001	-0.003	-0.003	-0.010**
	(0.26)	(-1.00)	(-0.48)	(-2.11)
Underwriter Reputation	0.001	0.003	0.001	0.024***
	(0.35)	(1.36)	(0.43)	(4.82)
Nasdaq	0.001	0.006	-0.003	0.003
	(0.14)	(0.74)	(-0.39)	(0.25)
Adjusted R^2 (%)	9.78	6.48	12.78	35.41

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.
$^{+++}$, $^{++}$, $^{+}$ respectively denote that the means are significantly different for the undercapitalized and well-capitalized samples at the 1%, 5%, and 10% significance level.

The Note for this table is on the page following.

Note. Panel A reports mean announcement period abnormal returns for only undercapitalized SEOs, based on the regulatory capital adequacy norms prevailing in the year of the issue, further segregated into two groups according to the sign of the abnormal pre-announcement stock price run-up. Panel B reports the same analysis for the pre-FDICIA sample period only. Panel C shows the coefficients and in parenthesis the associated heteroskedasticity-robust *t*-statistics from estimating the following regression model within undercapitalized and well-capitalized subsamples

$$\begin{aligned} CAR\ (-1,+1) = {} & \beta_1\, Shumway\ Measure \\ & + \beta_2 CAR(-60, -4) + \beta_3\, Overcapitalization\ (or\ Undercapitialization) \\ & + \beta_4 \ln(Relative\ Issue\ Size) + \beta_5 \ln(Assets) \\ & + \beta_6\, Underwriter\ Reputation + \beta_7\, Nasdaq + \varepsilon, \end{aligned}$$

A vector of year fixed effects is included. *Shumway Measure* is the Shumway (2001) measure of bankruptcy likelihood, *Overcapitalization* (or *Undercapitalization*) measure the extent to which the issue exceeds (or falls short of) capital adequacy standards, ln(*Relative Issue Size)* is the natural log of the issue size as a proportion of issuer assets, ln*(Assets)* is the natural logarithm of the total assets as of the end of the quarter immediately before the announcement, *Underwriter Reputation is* the Carter-Manaster lead underwriter reputation score, and *Nasdaq* is an indicator variable for banks listed on Nasdaq.

Table 6
Pre-announcement quarter stock sales by insiders

Panel A

	Full sample period: 1983-2005	
	Undercapitalized-bank Offers	Well-capitalized-bank Offers
N	23	147
Mean Dollar volume	116,497*	489,120**
Mean Number volume	4,694*	12,925**
Mean Net Proportional Sales	0.08**	0.10**

Panel B

	Pre-FDICIA sample period: 1983-1989	
	Undercapitalized-bank Offers	Well-capitalized-bank Offers
Number of observations	30	31
Mean dollar sales	95,888*	153,317*
Mean share sales	6,745*	22,761**
Mean net proportional sales	0.11**	0.16**

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.
+++, ++, + respectively denote that the means are significantly different for the undercapitalized and well-capitalized samples at the 1%, 5%, and 10% significance level.

Note. This table reports the net sales of equity by issuer insiders of the issuer in the quarter preceding issue announcement, averaged for various samples of interest. Net sales is defined as sales minus purchases of issuer's equity shares. Net sales are shown as both the number of shares and the dollar volume. Net proportional sales is net dollar sales divided by the insider ownership as at the end of the quarter immediately prior to the issue announcement.

Table 7
Determinants of bank SEOs

	Full sample period (1983-2005)		Pre-FDICIA sample period (1983-1989)	
	Undercapitalized issues	Well-capitalized issues	Undercapitalized issues	Well-capitalized issues
	N = 1,332	*N = 14,805*	*N = 959*	*N = 4,651*
M/B	8.25	1.17	8.15	1.10
	(3.30) ***	(2.15) **	(3.79) ***	(1.71) *
Overcapitalization (or Undercapitalization)	3.11	-7.01	3.25	-4.03
	(0.32)	(-1.75) *	(0.58)	(-1.43)
M/B × *Overcapitalization (or Undercapitalization)*	1.41	-1.70	1.54	-1.13
	(1.36)	(-1.99) **	(1.32)	(-1.91) *
ln(*Assets*)	-4.50	-3.85	-3.28	-4.11
	(-2.99) ***	(-3.97) ***	(-3.34) ***	(-5.61) ***
Pseudo R^2 (%)	87.47	82.18	86.93	79.98

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.

Note. This table shows logit regression coefficients and, in parenthesis, *t*-statistics based on heteroskedasticity-robust standard errors adjusted for clustering by bank, of the following logit regression run separately for well-capitalized and undercapitalized banks:

$$\begin{aligned} Issue_{i,t} = \quad & \beta_1 M/B_{i,t-1} + \beta_2 Overcapitalization\ (or\ Undercapitalization)_{i,t-1} \\ & + \beta_3 M/B_{i,t-1} \times Overcapitalization\ (or\ Undercapitalization)_{i,t-1} \\ & + \beta_4 \ln(Assets_{i,t-1}) + e_{i,t} \ , \end{aligned}$$

A vector of year fixed effects is included. $Issue_{i,t}$ is an indicator variable equal to one if an SEO is announced by bank *i* in quarter *t* and zero otherwise, $M/B_{i,t-1}$ is the market value to book ratio of bank *i* in quarter *t-1*, $Overcapitalization_{i,t-1}$ (or $Undercapitalization_{i,t-1}$) is the extent to which bank *i* exceeds (or falls short of) capital adequacy requirements in quarter *t-1*, and $\ln(Assets_{i,t-1})$ is the natural log of total bank assets in quarter *t-1*.

Table 8
Post-SEO abnormal returns

Panel A: Post-SEO calendar time abnormal returns (*CTAR*s)

		Full sample period: 1983-2005		Pre-FDICIA sample period: 1983-1989	
Issuers within the past:	Number of events and *CTAR* type	Undercapitalized Issues	Well-capitalized issues	Undercapitalized issues	Well-capitalized issues
1 Year	N	73	203	58	65
	3-Factor	0.75	0.49*	1.11	0.56
	4-Factor	0.59	0.41	0.96	0.72
2 Years	N	73	190	58	65
	3-Factor	0.18	0.55*	-0.05	0.28
	4-Factor	0.13	0.56*	-0.17	0.31
3Years	N	73	180	58	65
	3-Factor	0.06	0.24	-0.25	0.13
	4-Factor	0.09	0.26	-0.21	0.18

Panel B: Post-SEO buy-and-hold abnormal returns (*BHAR*s) using industry-size matched equal-weighted reference portfolios

		Full sample: 1983-2005		Pre-FDICIA sample period: 1983-1989	
Holding Period	Number of events and sample size protocol	Undercapitalized issuers	Well-capitalized issuers	Undercapitalized issuers	Well-capitalized issuers
1 Year	N	60	157	48	50
	BHAR (constant sample)	2.93	0.25	-0.84	1.14
	N	60	180	Same as constant sample	
	BHAR (maximum sample)	2.93	0.93		
2 Years	N	60	157	48	50
	BHAR (constant sample)	2.74	-0.21	1.20	3.96
	N	60	167	Same as constant sample	
	BHAR (maximum sample)	2.74	0.25		
3 Years	N	60	157	48	50
	BHAR (constant sample)	10.42	-1.29	7.83	3.75
	N	60	157	Same as constant sample	
	BHAR (maximum sample)	10.42	-1.29		

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.
+++, ++, + respectively denote that the means are significantly different for the undercapitalized and well-capitalized samples at the 1%, 5%, and 10% significance level.

The Note for this table is on the page following.

Note. Panel A shows 3-factor and 4-factor Fama-French calendar time risk-adjusted long-run abnormal stock returns. The 3-factor and 4-factor *CTAR*s are respectively α^3 and α^4 estimated for the following alternative time-series regression models:

$$r_{pt} = \alpha^3 + b \times RM_t + s \times SMB_t + h \times HML_t + \zeta_t,$$
$$r_{pt} = \alpha^4 + b \times RM_t + s \times SMB_t + h \times HML_t + u \times UMD_t + \zeta_t,$$

where r_{pt} is the excess return (over the risk free rate, the one-month Treasury bill rate) of an equally-weighted portfolio of bank SEO issuers, where each month, the portfolio is rebalanced to include all sample banks that have had an SEO event in the last *n* months (where *n* is 12, 24, or 36, depending on the long-run return horizon being studied), *RM* is the value-weighted CRSP index excess return over the one-month Treasury bill return, *SMB* is the return on a zero investment portfolio formed by subtracting the return on a small firm portfolio from the return on a big firm portfolio, *HML* is the return on a zero investment portfolio calculated as the return on a portfolio of high book-to-market stocks minus the return on a portfolio of low book-to-market stocks, and *UMD* is the return on a zero investment portfolio calculated as the return on a portfolio of high momentum stocks minus the return on a portfolio of low momentum stocks. The time series factor model is estimated by ordinary least squares with robust standard errors used to judge significance levels.

Panel B shows mean post-SEO industry-size adjusted buy-and-hold abnormal returns (*BHAR*). Two separate sample size protocols are used in constructing mean *BHAR*s: (a) the "constant sample" of event/banks for which we can compute *BHAR*s for all holding periods up to three years, and the "maximum samples" for which we can compute *BHAR*s at each particular time horizon, respectively. The reference portfolio is a size-matched portfolio of bank stocks. The reference portfolio return is the equal-weighted return of the portfolio of reference stocks, and the *BHAR* is the difference between compound return to the issuer's stock and that of its reference portfolio. Significance levels are assessed based on skewness-adjusted *t*-statistics and bootstrapped critical values computed using the methods of Lyon, Barber and Tsai (1999).

Table 9
Post-SEO abnormal operating performance
Panel A: Three year post-SEO horizon

		Full sample period: 1983-2005		Pre-FDICIA sample period: 1983-1989	
Horizon		Undercapitalized issues	Well-capitalized issues	Undercapitalized issues	Well-capitalized issues
	N	45	93	41	36
	ROA	-0.004	-0.273**	-0.018	-1.018
3 Years	*Net Interest Margin*	0.085	0.074	0.067	0.300
	Operating Income Ratio	0.003	-0.086*	-0.048	-0.385
	Profit Margin	-0.935*	-1.639***	-1.236*	-2.063*

Panel B: Year-by-year post-SEO horizons

		Full sample period: 1983-2005		Pre-FDICIA sample period: 1983-1989	
Horizon		Undercapitalized issues	Well-capitalized issues	Undercapitalized issues	Well-capitalized issues
	N	56	123	51	49
	ROA	0.089*	-0.037+	0.080*	0.043
1st Year	*Net Interest Margin*	0.175	0.050	0.187	0.120
	Operating Income Ratio	0.087	-0.031	0.048	0.016
	Profit Margin	0.316	-0.667	0.114	0.518
	N	55	115	50	47
	ROA	0.052	-0.150***+++	0.044	-0.121
2nd Year	*Net Interest Margin*	0.101	0.023	0.083	0.145
	Operating Income Ratio	-0.009	-0.161**	-0.052	-0.011
	Profit Margin	0.423	-1.979***+++	0.293	-1.493
	N	52	108	47	44
	ROA	-0.146	-0.586**	-0.170	-2.932*
3rd Year	*Net Interest Margin*	0.108	0.059	0.087	0.493
	Operating Income Ratio	-0.071	-0.240*+	0.044	-1.242
	Profit Margin	-1.308*	-4.464**	-1.468	-12.322**

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.
+++, ++, + respectively denote that the means are significantly different for the undercapitalized-bank and well-capitalized-bank samples at the 1%, 5%, and 10% significance level.

The Note for this table is on the page following.

Note. Panel A shows the mean operating performance measures of the undercapitalized-bank and well-capitalized-bank issues over the three year period post-SEO. The operating performance measures are: (a) the ratio of net income to total asset (*ROA)*, (b) the difference between interest income and interest expense scaled by the earning assets (*Net Interest Margin*), (c) the ratio of operating income to earning assets (*Operating Income Ratio*), and (d) the ratio of net income to revenues (*Profit Margin*). The four measures of operating performance are match-adjusted. The match-adjusted performance measure is calculated by subtracting the median performance measure of a matching set of non-SEO banks from the issuing bank's performance measure.

Panel B shows the mean match-adjusted operating performance for each of the three years post-SEO, following the same conventions.

Table 10
Robustness checks
Panel A: Announcement period abnormal returns

Announcement Window		Full sample period: 1983-2005 Undercapitalized issues	Full sample period: 1983-2005 Well-capitalized issues	Pre-FDICIA sample period: 1983-1989 Undercapitalized issues	Pre-FDICIA sample period: 1983-1989 Well-capitalized issues
CAR (-1,0)	*N*	73	203	58	65
	Mean	-0.90***	-0.91***	-1.27***	-1.36***
	Median	-0.92	-0.53	-1.09	-0.96
CAR (0,+1)	Mean	-1.26***	-1.41***	-1.41***	-1.87***
	Median	-1.69	-1.11†	-1.71	-1.25
CAR (-1,+1)	Mean	-1.15***	-1.56***	-1.51***	-2.25***
	Median	-1.32	-1.30	-1.64	-1.92
CAR (-3,+3)	Mean	-1.76***	-1.70***	-1.96***	-2.49***
	Median	-2.29	-1.71	-2.22	-1.26†

Panel B: Long-run buy-and-hold returns (*BHAR*)

Holding Period		Full sample period: 1983-2005 Undercapitalized Issues	Full sample period: 1983-2005 Well-capitalized Issues	Pre-FDICIA sample period: 1983-1989 Undercapitalized issues	Pre-FDICIA sample period: 1983-1989 Well-capitalized issues
1 Years	N	67	155	53	47
	BHAR (constant sample)	3.21	3.14	-1.57	-7.20*
	N	67	177	Same as constant sample	
	BHAR (maximum sample)	3.21	3.07		
2 Years	N	67	155	53	47
	BHAR (constant sample)	5.49	0.93	0.40	-15.07**
	N	67	164	Same as constant sample	
	BHAR (maximum sample)	5.49	0.58		
3 Years	N	67	155	53	47
	BHAR (constant sample)	6.24	6.57	-0.96	-14.76**
	N	67	155	Same as constant sample	
	BHAR (maximum sample)	6.24	6.57		

***, **, * respectively denote significantly different from zero at the 1%, 5%, and 10% significance level.
+++, ++, + respectively denote that the means are significantly different for the undercapitalized-bank and well-capitalized-bank samples at the 1%, 5%, and 10% significance level.
†††, ††, † respectively denote that the undercapitalized-bank and well-capitalized-bank samples are significantly different from one another at the 1%, 5%, and 10% significance level by the Wilcoxon rank-sum test.

The Note for this table appears on the page following.

Note. Panel A shows descriptive statistics for announcement period abnormal stock returns, *CAR(i,j)*, from date i to date j, calculated using a market model that uses market returns (equally-weighted CRSP index returns) at two leads and two lags in addition to the contemporaneous return as explanatory variables. The parameters of the market model are estimated over a post-announcement period from 21 days through 120 days after the announcement date, following the methodology of Cornett and Tehranian (1994).

Panel B shows the 12, 24, and 36-month buy-and-hold abnormal returns (*BHAR*) calculated following the methodology of Cornett, Mehran and Tehranian (1998). The reported sample sizes are determined two different ways: (a) a constant sample for which we can compute 3-year abnormal returns, and (b) the samples for which we could compute the one, two and three year *BHARs*, respectively, i.e., the sample sizes depend on the length of period for which *BHAR* is computed. *BHAR* is computed using 125 reference portfolios based on book-to-market ratio, size (market value of equity), and momentum. The reference portfolio is allowed to update, so there is annual rebalancing and changes in reference stocks' identities. The reference portfolio return is the equal-weighted return of the portfolio of reference stocks. Reference portfolio stocks must have entered the Compustat database at least two years before the beginning of the year in question. Our sample of issuer stocks are not excluded from appearing in the reference portfolio.