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Article

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Journal of Risk and Financial Management

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Suggested Citation: Krishnan, C. N. V.; He, Yu (2022) : Investor perception, market reaction, and post-issue performance in bank seasoned equity offerings, Journal of Risk and Financial Management, ISSN 1911-8074, MDPI, Basel, Vol. 15, Iss. 7, pp. 1-21, <https://doi.org/10.3390/jrfm15070275>

This Version is available at:

<https://hdl.handle.net/10419/274797>

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Article

Investor Perception, Market Reaction, and Post-Issue Performance in Bank Seasoned Equity Offerings

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Abstract: Using a large sample of bank seasoned equity offerings (SEO) from 2002 to 2017, we first documented detailed descriptive statistics, and showed that nonperforming assets ratio, our primary measure of bank asset quality, reached the highest value immediately after the 2008 economic crisis, which also corresponds to a higher number of SEOs around these years because banks needed to recapitalize. The capital ratio, which is required to be at least at a minimum level (relative to risk-weighted assets) for banks by regulation, also increased after the economic crisis, which may be due to a higher requirement for banks as well as banks' desire to hold more capital. The SEO announcement period abnormal stock-returns reached the lowest number around the economic crisis, as did the longer-run 6-month, post-SEO cumulative abnormal returns and buy-and-hold abnormal returns. Examining the differences between banks, we found, in both univariate and multivariate regression results controlling for other variables, that the bank capital ratio as at the time of the SEO announcement is significantly and positively associated with announcement period abnormal returns, while nonperforming assets ratio of the bank as at the time of SEO announcements is not. However, the nonperforming assets ratio as at the time of the SEO announcements had a significantly negative association with post-SEO, 6-month longer-run abnormal stock returns, while the capital ratio did not have any significant association. The nonperforming assets ratio as at the time of SEO announcement was also significantly and negatively related to bank return on assets 6 months and 12 months after SEO, while the capital ratio was not. Thus, investors appear to perceive a well-ingrained, well-publicized regulatory norm—the capital ratio—as indicative of value creation as at the time of bank SEO announcements, while loan asset quality, which may be relatively more opaque, may determine post-SEO performance.

Keywords: seasoned equity offering; capital ratio; nonperforming assets ratio; announcement period abnormal returns; post-issue bank performance



Citation: Krishnan, CNV, and Yu He. 2022. Investor Perception, Market Reaction, and Post-Issue Performance in Bank Seasoned Equity Offerings.

Journal of Risk and Financial Management 15: 275. <https://doi.org/10.3390/jrfm15070275>

Academic Editor: Shigeyuki Hamori

Received: 7 June 2022

Accepted: 20 June 2022

Published: 23 June 2022

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1. Introduction

In this paper, using a large sample of bank seasoned equity offerings (SEO) announced from 2002 to 2017, we examine the determinants of the announcement period abnormal stock returns, and longer-term post-SEO abnormal stock returns and bank performance. The reason for doing so is to check whether certain, well-publicized and ingrained bank features such as the capital ratio influence investor reactions, and if so, whether they actually also determine longer-term, post-SEO returns and performance.

The motivation for our study comes from the following different strands of literature. Recent World Bank research argues that a healthy and reliable financial system is critical to economic development (Echandi et al. 2015). From 1970 to 2017, there were 151 banking crises, 236 currency crises, and 74 sovereign crises (Laeven and Valencia 2018). The most disruptive global economic events among these crises are systemic banking

crises. They can cause a capital flight, considerable reduction in credit availability, and occasionally a massive decrease in the standard of living (Berger and Bouwman 2013; Beck et al. 2006). These crises may happen to individual banks or an entire banking system (Honohan and Laeven 2005). Every generation seems to have had its financial crisis (Kindleberger 2000). Several academic papers have analyzed the reasons for these crises and helped develop policies to help prevent them, including capital adequacy ratios (Aebi et al. 2012; Ivashina and Scharfstein 2010).

In the U.S., the Federal Deposit Insurance Corporation Improvement Act (FDICA) encourages banks to avoid prompt corrective action sanctions by maintaining minimum equity capital ratios (Haubrich 2020). Thus, bank seasoned equity offerings (SEOs) that may be required to shore up equity ratios need not be perceived the same way as SEOs announced by nonbanks (Raskovich 2008). The announcement effect of bank SEOs could differ from other firm SEOs (Dinger and Vallascas 2016), when nonbank stock issuances, including SEOs, can significantly underperform the market compared to non-issuing firms in the longer-run post-issue (Loughran and Ritter 1995). SEOs made by banks that are undercapitalized relative to regulatory standards may be perceived to be “non-discretionary” or “involuntary”; in contrast, those made by well-capitalized banks may be perceived to be fully discretionary or voluntary (Krishnan et al. 2010). Mehran and Thakor (2011) argue that good banks may use equity issuances to showcase safety, differentiating them from low-quality banks. Li et al. (2016) show that bank regulation and financial crisis can influence the announcement period effects. Mehran and Thakor (2011) argue that “good” and “bad” banks may use equity issuances for different purposes. However, the primary assets for most banks, loans, are arguably more opaque than other firm assets (Flannery et al. 2013; Yue et al. 2022).

Therefore, the objective of our paper is as follows. Several years of bank regulations and capital adequacy norms are ingrained in investors’ minds. Therefore, investors may perceive a higher capital ratio as indicative of bank safety and value creation. However, bank loans, its main assets, are relatively opaque in terms of their quality, as compared to the assets in other industries. Investors do have access to numbers such as the nonperforming assets ratio, or loan loss provisions. However, do they consider these numbers, as opposed to the well-publicized capital ratios, when reacting to bank SEO announcements? And what actually matters for longer-term abnormal stock returns and bank performance post-SEO?

We examine 311 bank SEOs announced and made in the 2002–2017 period. First, we examined the relationship between capital ratio or equity ratio (defined as Tier 3 capital ratio) and announcement period return. We found that a high capital ratio (higher than the sample median) at the time of SEO announcement is significantly and positively associated with higher announcement period returns. This positive relationship held across different alternative methods of computing announcement period abnormal returns and held whether we examined univariate results or multivariate regression results after controlling for other variables and time-fixed effects. This indicates that investors are more confident that banks with higher capital ratios and may be more likely to use SEO money wisely and create value in the future. However, bank capital ratio at the time of SEO announcement is not significantly associated with long-term post-SEO returns and performance. Instead, we found a significant negative association between nonperforming assets ratio at the time of bank SEO announcements and long-term post-SEO returns and performance. This negative relationship held across different methods of computing post-issue abnormal returns and performance. This negative relationship held whether we examine univariate results or multivariate regression results after controlling for other variables and time-fixed effects. The implication is that the quality of banks’ assets at the time of the SEO announcement may be one of the important determinants of post-issue returns and performance.

There is evidence for this in related literature. [Meeker and Gray \(1987\)](#), for example, argue that nonperforming asset information can be a useful aid in analyzing the asset quality of banks, particularly when the information is timely. [Reinhart and Rogoff \(2011\)](#) argue that a large increase in bankruptcies or nonperforming loans marks the onset of a crisis. [Leung et al. \(2015\)](#) find strong evidence that nonperforming loans are positively related to marketwide default and residual risks and that the marginal effects of nonperforming loans on bank risk are approximately three times larger in a crisis period as compared to a non-crisis period. However, some ingrained and prevalent measures such as the capital ratio may drive investor reactions. [Tetlock et al. \(2008\)](#) argue that linguistic media content captures otherwise hard-to-quantify aspects of firms' fundamentals, which investors quickly incorporate into stock prices. However, [Clarke et al. \(2021\)](#) find no evidence that article commenters can detect fake news, and that Seeking Alpha editors have only modest ability to detect fake news.

The novelty of our paper is that we bring these different strands of literature together to examine what investors focus on as important features that could determine future value creation, at the time of announcements, are actually associated with future stock returns and operating performance. Our paper is organized as follows. Literature review is in Section 2. Section 3 describes the data and variables we use in our paper. Section 4 presents univariate results, and Section 5 the multivariate results. Section 6 wraps up with discussion and conclusions.

2. Literature Review

There is extensive literature on bank capital structure and capital ratios. [Diamond and Rajan \(2000\)](#) state that a high bank capital ratio can lead to a lower probability of financial distress, but it may also lead to depleted liquidity. [Gropp and Heider \(2010\)](#) find that the most important determinant of banks' optimal capital structures is unobserved time-invariant bank fixed effects. [Liu \(2018\)](#) shows that a growth-oriented bank may issue equity because of the effectiveness of market discipline in banking. [Martinez Peria and Schmukler \(2001\)](#) believe that there are several ways that market discipline can benefit the bank industry, such as reducing moral hazard incentives and improving the operation of inefficient banks. There are also global studies on regulation. For instance, [Nier and Baumann \(2006\)](#) examine that market discipline is very useful in providing incentives to limit the risk of default. Using a global SEO sample, [Dinger and Vallascas \(2016\)](#) show that the likelihood of issuing SEOs is higher in poorly capitalized banks. These papers indicate that banks issue equity to meet the regulatory requirement of capital and perhaps reduce risk while pursuing growth. However, other papers do not support this theory. [Estrella \(2004\)](#) suggests that banks are not forced by regulation to hold a certain level of capital. Instead, they may hold more than the minimum capital ratio required by regulation. [Liu \(2018\)](#) finds that banks increased their capital ratios as well as deposits and assets following SEOs and argues that the overall risk may actually increase after SEO. [Fahlenbrach et al. \(2018\)](#) also focus on the asset expansion of banks. They conclude that banks with higher loan growth significantly underperform banks with lower loan growth. Thus, it may be crucial to focus on loan quality, not simply on loan growth, which is what we investigate in this paper.

[Wansley and Dhillon \(1989\)](#) argue that there is a significant adverse reaction to the issuance of common stock announcements. The negative impact of equity issues by the bank may be larger or smaller than those for nonfinancial firms ([Polonchek et al. 1989](#)). Some papers find that the bank SEO has a higher stock abnormal returns than a nonbank sample ([Li et al. 2016](#)). [Fahlenbrach et al. \(2018\)](#) document a negative announcement effect because the market may worry these banks might be overoptimistic about their asset expansion plans. [Krishnan et al. \(2010\)](#) also document negative stock price reactions to SEO announcements for both undercapitalized and well-capitalized banks. Our results dig deeper into the differences in announcement period reaction between banks and their

reasons. We then examine the longer-term post-SEO returns and performance and the reasons thereof.

Our scientific contribution in this paper to the literature is twofold. First, we examine the announcement period reaction and the reasons for the differences thereof between banks. We show that a banks' capital ratio at the time of SEO announcement, the benefits of which are well-touted because of regulations, is perceived by the investors as indicative of safety and value creation. Second, we examine the differences in the post-SEO longer-term returns and performance, and show these are not related to the bank's capital ratio as at the time of SEO announcement. Instead, they depend on asset quality at the time of SEO announcement that may not be as easily perceived as the capital ratio because of the relative opaqueness of bank assets.

3. Data, Variables, and Descriptive Statistics

3.1. Data

We start with a database of 671 bank SEOs made in the 2000–2018 period, collected from Refinitiv's Securities Data Company's (SDC) Platinum Global Public Issues database. Bank and stock market details are taken from COMPUSTAT and Center for Research in Security Prices (CRSP) databases.

We require the following screens. All the issuers (banks) must have the data we need on both COMPUSTAT and CRSP, leading to a sample with 570 SEOs. Next, a bank must have daily prices from 3 days before SEO to 3 days after SEO and monthly prices from 36 months before SEO to 24 months after SEO to calculate equity beta, β , and the long-term returns. Moreover, banks must have all the required accounting data from COMPUSTAT one quarter before the SEO event to six months and twelve months after the SEO event. This leads to a final SEO sample of 311 cases with all data we need, from 2002 to 2017 after dropping years with very few bank SEOs which may have skewed our results.

To compare and calculate the abnormal return, we use daily price, monthly price, different daily index prices, and monthly index prices, all taken from CRSP. To compare bank characteristics, we use financial information taken from COMPUSTAT, including operating revenue, total assets, net interest margin, net income, total shareholder equity, total liabilities, total shares outstanding, nonperforming loans, gross loans, and net charge-offs, etc. Some of them are used directly, while others are used to compute various ratios, which will be discussed in the next part.

All analyses are conducted using SAS software on a computer with Windows 10 64-bit. The runtime for each regression or analysis is around 30 s. The output and data analysis are also generated using SAS software, of the SAS Institute Inc, Cary, North Carolina, USA.

3.2. Variables

We calculate announcement period abnormal returns as well as the longer-term post-issue abnormal returns post-event based on various benchmark returns that include S&P 500 index return, CRSP value-weighted, and CRSP equal-weighted market returns. Following Ball and Kothari (1991) and Cohen et al. (2007), we define announcement period abnormal returns as -1 to $+1$ day around SEO announcement date, which is date 0 (3-day returns), and the -3 to $+3$ days around announcement date (7-day returns), over and above different benchmark returns calculated as stock return minus $\beta \times$ S&P 500 return or VWCRSP return, or EWCRSP return over the same period. For long-term abnormal returns, we compute cumulative abnormal returns and buy-and-hold abnormal returns for six months after SEO issuance, following Barber and Lyon (1997) and Krishnan and He (2022). All abnormal returns are calculated over and above beta times S&P 500 index return, value-weighted index return, and equal-weighted index return. Cumulative abnormal return is the sum of monthly abnormal returns across periods, written as:

$$CAR_i = \sum_k AR_{i,t+k}$$

Buy-and-hold abnormal return is calculated as the product of monthly abnormal return minus 1, written as:

$$BHAR_i = \Pi_k(1 + AR_{i,t+k}) - 1$$

We compute several ratios, including the return on assets (ROA), calculated by dividing net income by the total assets following the method demonstrated by [Alam et al. \(2021\)](#), the loan-to-assets ratio calculated as the total loan scaled by total assets ([Elekdag et al. 2020](#)), tier 3 capital ratio as our measurement of capital ratio following [Demirguc-Kunt et al. \(2013\)](#), which is the sum of tier 1 and tier 2 capital ratios. Tier 1 capital ratio is common shareholder's equity plus noncumulative preferred stock plus minority interest minus goodwill minus 50 percent investment in certain subsidiaries as a percent of adjusted risk-weighted assets. Tier 2 capital ratio is cumulative preferred stock plus qualifying debt plus qualifying allowance for credit losses minus 50 percent investment in certain subsidiaries as a percent of adjusted risk-weighted assets. Market-to-book ratio is calculated as the market share price divided by the book value per share, where book value is total stockholders' equity representing the common and preferred shareholders' interest in the company, and the market value of equity (MVE) is calculated by multiplying the number of shares outstanding by the share price during that time which is the same as in [Cooper et al. \(2008\)](#). Following [Zhang et al. \(2016\)](#), we compute the nonperforming assets ratio of each bank as the ratio of nonperforming loans to the gross amount of loans. Nonperforming assets are loans and leases carried on a nonaccrual basis; loans which are 90 days past due, both accruing and non-accruing; renegotiated loans; real estate acquired through foreclosure; and repossessed movable property. The net charge-off ratio is calculated in the same manner as [Balasubramnian and Cyree \(2011\)](#) by net charge-off scaled by the gross amount of loans. Other variables such as net interest margin are directly taken from COMPUSTAT. Appendix A provides detailed descriptions of all variables used. All these bank characteristics are as of one quarter before the SEO issuance (that would be known to investors at the time of SEO announcement). We also winsorize all the variables, including different returns and bank characteristics, at the 5% level, to reduce the effect of outliers. The ARIMA procedure to test the stationarity of our variables, following [Chishti et al. \(2021\)](#) and [Weimin et al. \(2022\)](#), does not reject stationarity of our final data. We, nevertheless, include time dummy variables in our regressions, because of specific time-period effects detailed below.

3.3. Descriptive Statistics

Table 1 shows the number of seasoned equity offerings from 2002 to 2017. The year 2009 entails the largest SEO announcements, at 72, and the numbers every year after are at a relatively higher level than those in the pre-crisis period (perhaps because the economic crisis of 2008 necessitated banks to shore up their equity capital ratios), but the number per year drops in recent years. Table 2 shows the descriptive statistics of bank characteristics by year. We focus on bank loan quality, capital ratio, and earning indicators one quarter before they conduct SEO. Table 2A shows that the nonperforming assets ratio reaches the highest value immediately after the 2008 economic crisis, implying a drop in banks' loan quality. The median nonperforming assets ratio also reaches the highest value after the financial crisis, as shown in Table 2B. This also corresponds to a higher number of SEOs around these years because banks needed to recapitalize. Table 2 also shows that the capital ratio is more stable than the nonperforming assets ratio. It increased after the economic crisis, which may be due to a higher requirement for banks as well as banks' desire to hold more capital.

Table 1. Bank SEOs by year. This table shows the number of bank seasoned equity offering (SEO) announcements, by year in our sample. The sample period is from 2002 through 2017. The total number of bank SEOs in our sample is 311.

Year	Number of SEOs	Year	Number of SEOs
2002	10	2010	39
2003	10	2011	16
2004	9	2012	23
2005	11	2013	21
2006	12	2014	21
2007	2	2015	10
2008	24	2016	11
2009	72	2017	20
		Total	311

Table 2. Descriptive Statistics: BANK Features. This table reports key bank features by year. These include nonperforming assets ratio, capital ratio, loan-to-assets ratio, market-to-book ratio, return on assets (ROA), net interest margin, net charge-off ratio, and market value of equity (MVE). Panel A reports the mean of these key variables by year. Panel B reports the median of key variables by year. All variables are defined in the Appendix A. (A) Mean of key bank variables by year. (B) Median of key bank variables by year.

(A)								
Year	Nonperforming Assets Ratio	Capital Ratio	Loan to Assets Ratio	Market to Book Ratio	ROA	Net Interest Margin	Net Charge-Off Ratio	MVE
2002	0.005	10.851	0.657	2.473	0.019	3.561	−0.0004	3238
2003	0.007	11.384	0.585	2.118	0.015	3.575	0.0014	2803
2004	0.006	11.883	0.756	2.231	0.016	3.987	0.0002	1406
2005	0.006	13.006	0.634	1.299	0.015	3.576	0.0005	672
2006	0.004	12.258	0.667	2.171	0.018	3.657	0.0003	22,060
2007	0.007	11.765	0.691	1.476	0.020	3.885	0.0004	12,573
2008	0.012	11.659	0.675	1.250	0.017	3.338	0.0012	4512
2009	0.033	13.416	0.695	0.761	0.015	3.562	0.0037	1593
2010	0.063	13.226	0.701	1.278	0.014	3.545	0.0051	1726
2011	0.047	13.414	0.664	0.933	0.013	3.594	0.0050	606
2012	0.028	14.585	0.669	0.849	0.013	3.862	0.0014	358
2013	0.045	12.993	0.643	0.864	0.012	3.304	0.0023	687
2014	0.031	13.371	0.675	1.439	0.012	3.461	0.0014	1005
2015	0.015	13.067	0.749	1.313	0.012	3.867	0.0003	2029
2016	0.008	13.142	0.685	1.230	0.010	3.415	0.0003	1734
2017	0.008	12.446	0.765	1.570	0.012	3.574	0.0004	1916

Table 2. Cont.

(B)								
Year	Nonperforming Assets Ratio	Capital Ratio	Loan to Assets Ratio	Market to Book Ratio	ROA	Net Interest Margin	Net Charge-Off Ratio	MVE
2002	0.004	10.910	0.685	2.228	0.019	3.580	0.0000	290
2003	0.006	11.220	0.602	2.036	0.015	3.485	0.0005	509
2004	0.005	11.590	0.764	2.038	0.015	4.130	0.0002	230
2005	0.003	12.800	0.664	1.931	0.015	3.610	0.0001	237
2006	0.004	12.020	0.727	1.922	0.018	3.860	0.0002	663
2007	0.007	11.765	0.691	1.476	0.020	3.885	0.0004	1257
2008	0.010	11.365	0.676	1.191	0.017	3.470	0.0007	1080
2009	0.029	13.075	0.726	0.775	0.015	3.535	0.0026	279
2010	0.049	13.380	0.688	0.683	0.014	3.600	0.0037	160
2011	0.045	14.035	0.656	0.838	0.013	3.585	0.0036	225
2012	0.020	14.120	0.677	0.879	0.012	3.860	0.0007	131
2013	0.028	13.080	0.676	0.804	0.011	3.370	0.0011	93
2014	0.024	13.800	0.690	1.061	0.012	3.410	0.0005	135
2015	0.009	13.410	0.770	1.327	0.013	3.965	0.0002	840
2016	0.006	12.800	0.728	1.312	0.010	3.270	0.0002	864
2017	0.008	12.435	0.761	1.560	0.012	3.640	0.0001	208

Interestingly, the ROA ratio generally dropped from 2002 to 2017, from 1.9% in 2002 to 1.5% in 2003 to 1.2% in recent years, indicating that banks' earning ability has decreased. We do not observe a similar change in loan to assets ratio in Table 2A,B. This ratio before SEOs has been stable across years. However, net charge-off ratio reaches the highest mean and median immediately after the 2008 economic crisis.

Table 3 shows the descriptive statistics of announcement period abnormal returns (APAR) calculated over and above beta times S&P 500 index return. Most years have a negative APAR in the 3-day and 7-day returns around SEO announcements. Figure 1 shows APAR over and above beta times S&P 500 index, value-weighted, and equal-weighted index returns. We observe that APAR reached the lowest number around the economic crisis. The 3-day returns and 7-day returns are -0.028 and -0.018 , respectively, among SEOs issued in 2008. Table 3 and Figure 2 show that for 6-month post-issue cumulative abnormal return and buy-and-hold abnormal return, around half of the years in our sample show a negative abnormal return: the lowest long-term abnormal returns are in 2007 and 2008, which is also consistent with the announcement period return pattern. The lowest long-term abnormal returns are -0.217 and -0.206 around the economic crisis for cumulative abnormal returns and buy-and-hold abnormal returns, respectively. The trends of cumulative abnormal return and buy-and-hold abnormal return are consistent with each other, over time. Figure 3 shows capital ratio and nonperforming assets ratio from 2002 to 2017.

Table 3. Abnormal Returns. This table reports key bank abnormal returns by year. These are -1 to $+1$ day and -3 to $+3$ days abnormal return around SEO announcements, over and above beta times S&P 500 index returns, SP AR1, and SP AR 3, as well as the 6-month cumulative abnormal return and 6-month buy-and-hold abnormal return, post-SEO, over and above equity-beta times the S&P 500 index (SP CAR6 and SP BHAR6). Panel A reports the mean abnormal returns by year, and Panel B the median of abnormal returns by year. All variables are defined in the Appendix A. (A) Mean of abnormal returns by year. (B) Median of abnormal returns by year.

(A)				
Year	SP AR1	SP AR3	SP CAR6	SP BHAR6
2002	−0.018	−0.011	0.074	0.082
2003	0.005	−0.008	0.181	0.194
2004	0.009	0.012	0.095	0.098
2005	−0.025	−0.039	0.059	0.056
2006	−0.004	−0.012	−0.045	−0.044
2007	−0.016	0.005	−0.217	−0.206
2008	−0.028	−0.018	−0.125	−0.159
2009	−0.020	−0.025	−0.018	−0.021
2010	−0.002	−0.009	−0.166	−0.145
2011	−0.011	−0.017	−0.043	−0.048
2012	−0.016	−0.021	0.073	0.066
2013	−0.005	0.005	0.034	0.022
2014	−0.005	−0.009	−0.048	−0.052
2015	−0.010	0.003	−0.022	−0.011
2016	−0.017	0.004	0.125	0.142
2017	−0.024	−0.007	0.041	0.039
(B)				
Year	SP AR1	SP AR3	SP CAR6	SP BHAR6
2002	−0.022	−0.034	0.017	0.006
2003	0.014	−0.003	0.172	0.178
2004	0.014	−0.002	0.100	0.103
2005	−0.017	−0.038	−0.003	−0.004
2006	−0.007	−0.006	−0.006	−0.009
2007	−0.016	0.005	−0.217	−0.206
2008	−0.006	0.000	−0.160	−0.191
2009	−0.011	−0.032	0.063	0.024
2010	−0.017	−0.014	−0.099	−0.114
2011	−0.032	−0.029	−0.039	−0.066
2012	−0.009	−0.007	0.109	0.075
2013	−0.002	0.018	0.053	0.051
2014	−0.004	−0.002	−0.047	−0.055
2015	−0.008	0.002	0.001	−0.004
2016	−0.018	−0.015	−0.019	−0.029
2017	−0.015	−0.012	0.048	0.045

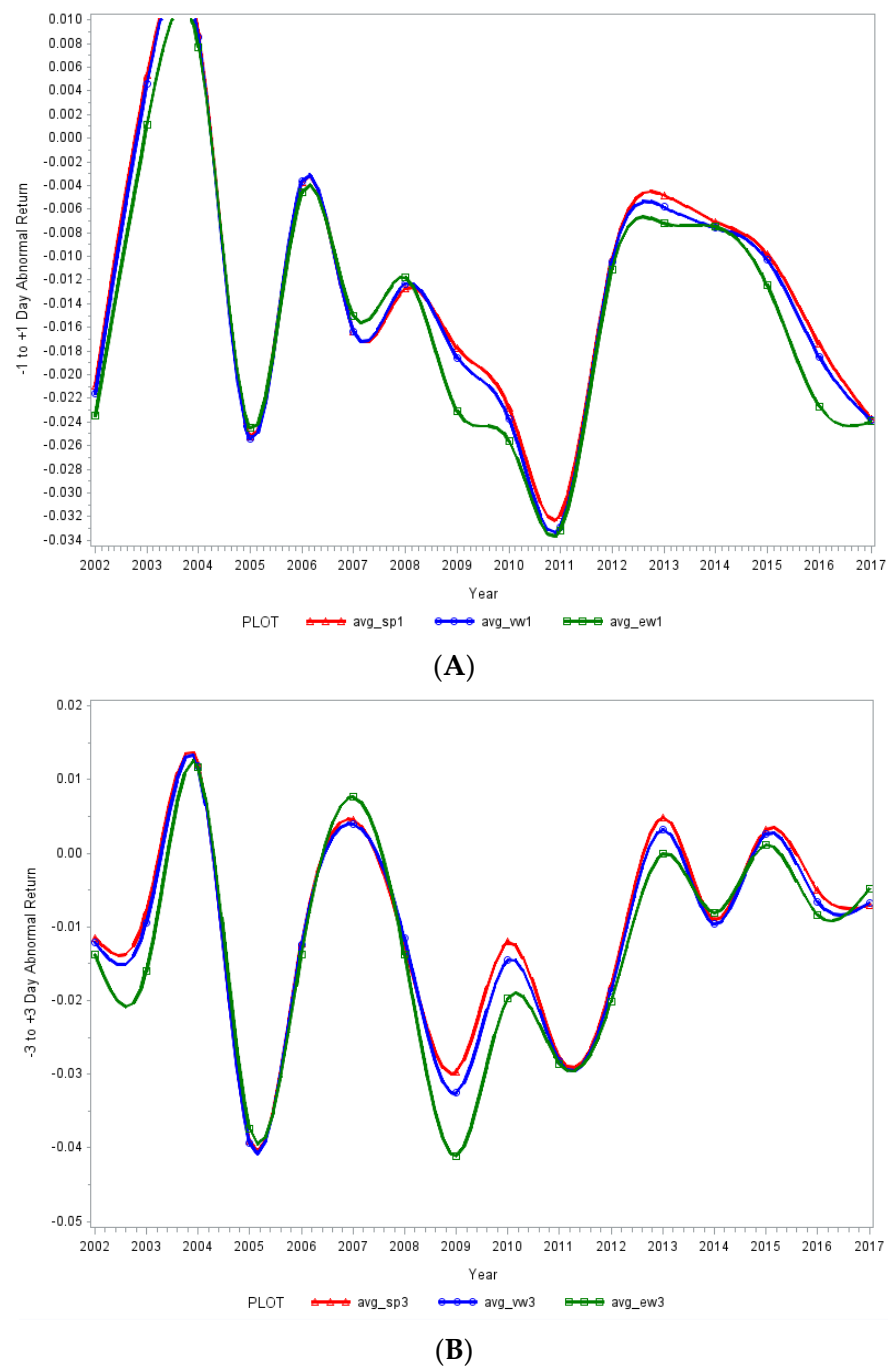
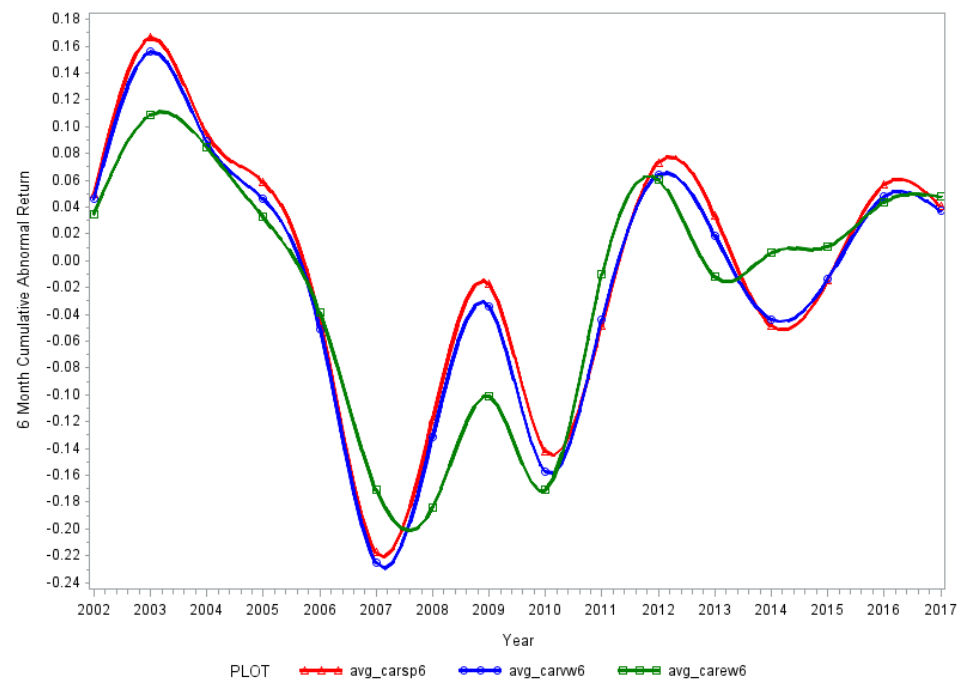
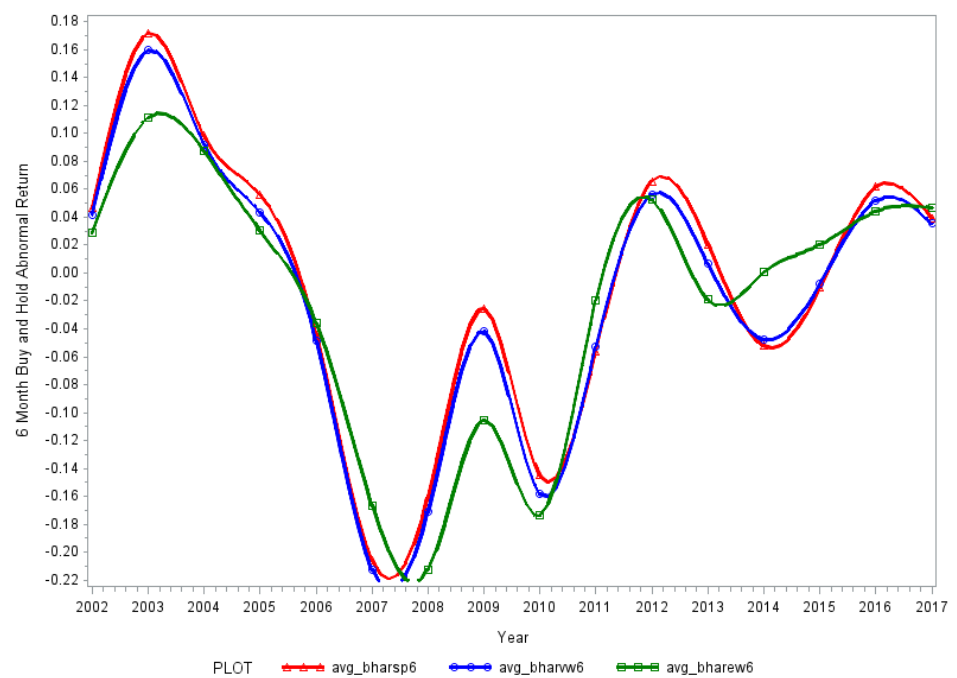


Figure 1. Announcement period abnormal returns. This figures above show the time series plots of annual average announcement period abnormal returns, APAR, around bank SEO announcements from -1 to $+1$ day, or from -3 to $+3$ days. These announcement period abnormal returns are over and above equity-beta times the S&P 500 index, value-weighted, or equal-weighted market returns. All variables are defined in Appendix A. (A) Average -1 to $+1$ Day Abnormal Return around bank SEO announcements by Year. (B) Average -3 to $+3$ Days Abnormal Return around bank SEO announcements by Year.



(A)



(B)

Figure 2. Longer-term abnormal returns. This figures above show the time series plots of annual average 6-month longer-term abnormal returns, LRAR, post-SEO. These long-term abnormal returns are computed as Cumulative Abnormal Return (CAR) or Buy-and-hold Abnormal Return (BHAR) over and above equity-beta times the S&P 500 index return, value-weighted CRSP market return, or equal-weighted CRSP market return. All variables are defined in Appendix A. (A) Average 6-Month Cumulative Abnormal Return, CAR, by Year. (B) Average 6-Month Buy-and-Hold Abnormal Return, BHAR, by Year.

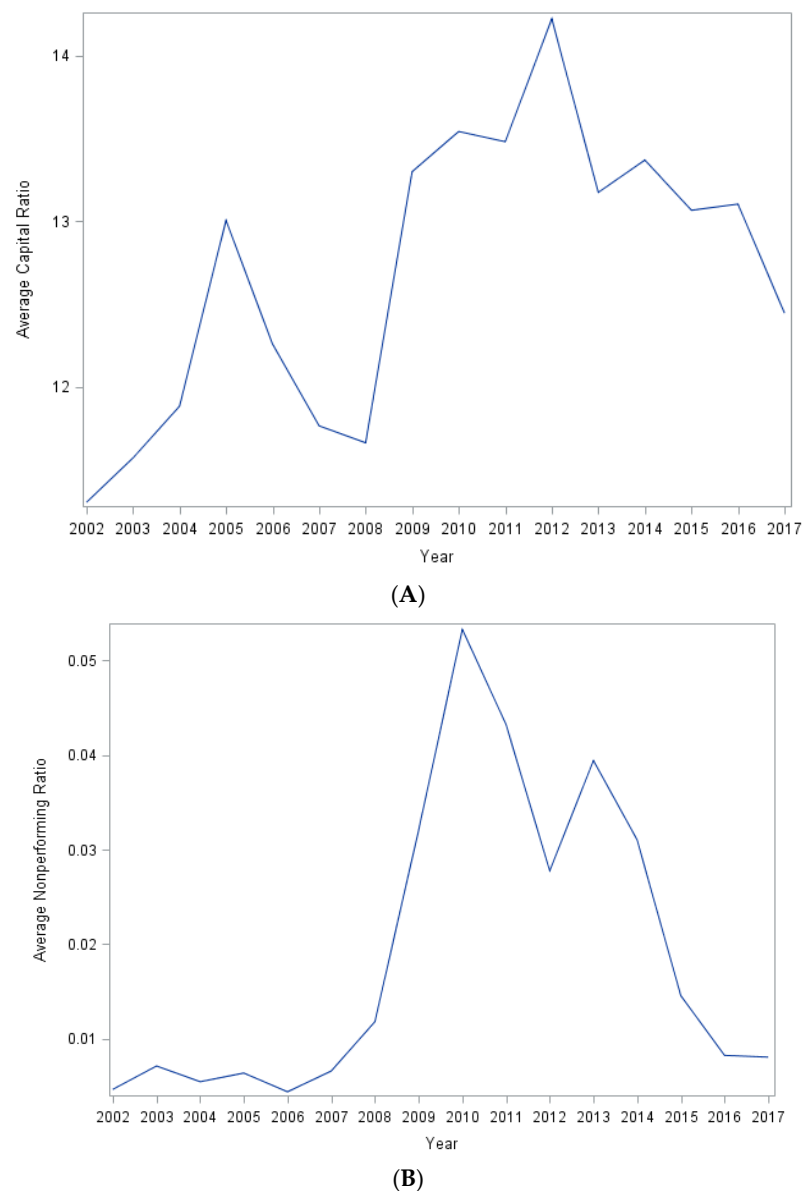


Figure 3. Capital ratio and nonperforming assets ratio. This figures above show the time series plots of annual average bank capital ratio, calculated as tier-3 Capital Ratio, and annual average nonperforming assets ratio, calculated as nonperforming loans divided by total loans, one quarter before SEO announcement. All variables are defined in Appendix A. (A) Average Capital Ratio by Year. (B) Average Nonperforming Assets Ratio by Year.

4. Univariate Results

In Table 4A, we divide the sample by capital ratio into a high capital ratio group, which are SEO announcements made by banks that have a capital ratio higher than the median capital ratio, and a low capital ratio group, which are SEO announcements made by banks with a capital ratio lower than the median capital ratio, and conduct mean tests and *Brown–Mood* median tests between these two groups. The left panel of Table 4A shows the difference of means bootstrapped *t*-tests. We can find that banks with higher capital ratios always have significantly higher APAR computed over -1 to $+1$ days and -3 to $+3$ days around the SEO announcements compared to banks with lower capital ratios, whether we look at S&P 500 index adjusted return or equal-weighted or value-weighted CRSP Index adjusted returns. This indicates that investors react more positively to SEO announcements by banks with a higher capital ratio.

Table 4. Sorting by key variables: abnormal returns and characteristics. This table reports mean and median abnormal returns and bank characteristics. Panel A separates the sample into banks with high capital ratio and low capital ratio by median capital ratio. Panel B separates the sample into banks with high nonperforming assets ratio and low nonperforming assets ratio by median nonperforming assets ratio. All variables are defined in the Appendix A. (A) Sorting by capital ratio. (B) Sorting by nonperforming assets ratio.

(A)				
	Difference of Means Test		Difference of Median Test	
	High Capital Ratio	Low Capital Ratio	High Capital Ratio	Low Capital Ratio
SP AR1	−0.010	−0.018 **	0.544	0.455 ***
VW AR1	−0.010	−0.018 **	0.540	0.459 ***
EW AR1	−0.012	−0.020 **	0.531	0.468 ***
SP AR3	−0.011	−0.021 **	0.541	0.462 ***
VW AR3	−0.012	−0.022 **	0.523	0.478
EW AR3	−0.015	−0.025 **	0.537	0.466 ***
SP CAR6	−0.017	−0.018	0.512	0.487
VW CAR6	−0.009	−0.029	0.507	0.493
EW CAR6	−0.000	−0.053	0.550	0.438
SP BHAR6	−0.020	−0.026	0.520	0.479
VW BHAR6	−0.032	−0.035	0.504	0.496
EW BHAR6	−0.055	−0.048	0.520	0.479
CR6	15.933	13.579 ***	0.723	0.267 ***
CR12	15.718	13.763 ***	0.669	0.322 ***
NR6	0.031	0.026	0.565	0.433
NR12	0.031	0.025	0.464	0.528
LTA6	0.069	0.067	0.551	0.448
LTA12	0.677	0.668	0.529	0.463
ROA6	0.013	0.014	0.464	0.537
ROA12	0.013	0.014	0.478	0.514
NCO6	0.002	0.002	0.532	0.467
NCO12	0.002	0.002	0.526	0.471
(B)				
	Difference of Means Test		Difference of Median Test	
	High Nonperforming Assets Ratio	Low Nonperforming Assets Ratio	High Nonperforming Assets Ratio	Low Nonperforming Assets Ratio
SP AR1	−0.018	−0.016	0.516	0.485
VW AR1	−0.018	−0.017	0.529	0.473
EW AR1	−0.020	−0.019	0.534	0.468
SP AR3	−0.019	−0.014	0.508	0.493
VW AR3	−0.021	−0.015	0.510	0.490
EW AR3	−0.025	−0.016 *	0.513	0.488
SP CAR6	−0.039	0.016 ***	0.474	0.525
VW CAR6	−0.051	0.007 ***	0.461	0.537 **
EW CAR6	−0.076	−0.011 ***	0.471	0.527
SP BHAR6	−0.046	0.013 ***	0.463	0.535 **
VW BHAR6	−0.057	0.004 ***	0.458	0.540 **
EW BHAR6	−0.081	−0.013 ***	0.458	0.540 **
CR6	15.457	13.858 ***	0.651	0.356 ***
CR12	15.757	13.951 ***	0.649	0.349 ***
NR6	0.045	0.009 ***	0.909	0.110 ***
NR12	0.043	0.009 ***	0.871	0.123 ***
LTA6	0.667	0.677	0.481	0.518
LTA12	0.659	0.673 **	0.470	0.531 **
ROA6	0.013	0.014 *	0.478	0.520
ROA12	0.013	0.014 *	0.495	0.506
NCO6	0.004	0.001 ***	0.743	0.270 ***
NCO12	0.003	0.001 ***	0.741	0.272 ***

*, ** and *** denote significant at the 10%, 5%, and 1% levels, respectively, with t-stat for difference of means test and z-stat for difference in median test.

Examining bank characteristics, banks with a higher capital ratio one quarter before SEO continue to have a higher capital ratio in 6 months and 12 months post-SEO, indicating that high capital ratio banks issuing equity continue to be safe post-SEO. The right panel of Table 4A shows that banks with high capital ratios have a higher median APAR than banks with low capital, using the *Brown–Mood* test, which is consistent with the difference of means test. The capital ratios of 6 months and 12 months after SEO are also consistent with the difference of means test. In summary, a high capital ratio one quarter before SEO announcement is correlated with higher announcement period abnormal stock returns and continued higher capital ratio post-SEO. However, importantly, we observe that capital ratio one quarter before SEO announcement is not significantly related to long-term post-SEO abnormal returns and performance.

In Table 4B, we segregate the sample into subsamples with a nonperforming assets ratio higher than the median nonperforming assets ratio and with a nonperforming assets ratio lower than the median nonperforming assets ratio. The left panel of Panel B shows the difference of means using bootstrapped *t*-tests. We find that banks with high nonperforming assets ratios always have significantly lower abnormal returns six months after the SEO issuance than banks with low nonperforming assets ratios. We also find that banks with a low nonperforming assets ratio one quarter before SEO are more likely to have a low nonperforming assets ratio in 6 months and 12 months after SEO. Banks with high nonperforming assets ratios also continue to have significantly higher nonperforming assets ratio, and lower ROA post-SEO. Panel B shows banks with a lower nonperforming assets ratio one quarter before SEO have significantly lower net charge-off ratio and higher ROA 6 months and 12 months post-SEO. Further, banks with high nonperforming assets ratios have higher capital ratios and lower loan-to-assets ratios 6 months and 12 months post-SEO. This could be because banks with higher nonperforming assets ratios may be required by regulation to have higher capital ratios and control the amount of risk-weighted assets.

In summary, banks with low nonperforming assets ratios continue to perform well in terms of loan quality and profitability post-SEO. The results are also consistent in *Brown–Mood* median tests. Overall, regarding the univariate results, investors are favorably disposed toward banks with higher capital ratios making SEO announcements, but the long-term returns and performance may depend on the quality of loan assets, as at the time of SEO announcements.

5. Multivariate Results

5.1. Determinants of Announcement Period Abnormal Returns

Table 5 reports multivariate autoregression explaining announcement period abnormal return (APAR) around SEO announcements, computed in different ways. We use autoregression because the same banks may repeatedly appear during the sample period. We include several control variables, as well as time-fixed effects, using the following model:

$$APAR = \beta_1 * \text{Capital Ratio} + \beta_2 * \text{Nonperforming Assets Ratio} + \beta_3 * \text{Capital Ratio} * \text{Nonperforming Assets Ratio} + \beta_i * \text{Control Variables} + \varepsilon \quad (1)$$

where APAR is the announcement period abnormal return from -1 to $+1$ day and from -3 to $+3$ days around SEO announcements, over beta times S&P 500 index return, value-weighted CRSP index return, or equal-weighted CRSP index return. Control variables include the bank's loan-to-assets ratio, market-to-book ratio, return on assets, net interest margin, and net charge-off ratio, as of the end of the quarter immediately before the SEO announcement. The main variables we focus on here are the bank's capital ratio and nonperforming assets ratio as of the end of the quarter immediately before the SEO announcement.

Table 5. Multivariate analysis of announcement period abnormal return and bank characteristics: −1 TO +1 DAY, −3 TO +3 DAY. This table reports multivariate regression results with bootstrapped t-statistics with dependent variable APAR computed in different ways—SP AR1, VW AR1, EW AR1, SP AR3, VW AR3, EW AR3. Control variables of banks as of one quarter before SEO announcements, and time-fixed effects are included. All variables are defined in the Appendix A.

Dependent Variable:	SP AR1	VW AR1	EW AR1	SP AR3	VW AR3	EW AR3
Capital Ratio	0.004 *** (2.79)	0.004 *** (2.72)	0.004 *** (2.71)	0.005 ** (2.13)	0.004 ** (2.07)	0.005 ** (2.38)
Nonperforming Assets Ratio	0.316 (0.74)	0.286 (0.67)	0.365 (0.83)	0.066 (0.11)	0.059 (0.10)	0.232 (0.37)
Loan to Assets Ratio	0.015 (0.77)	0.013 (0.71)	0.019 (0.94)	−0.035 (−1.22)	−0.034 (−1.20)	−0.020 (−0.69)
ROA	−0.878 (−0.94)	−0.939 (−1.01)	−1.251 (−1.31)	−0.555 (−0.38)	−0.652 (−0.45)	−0.855 (−0.57)
Net Interest Margin	0.008 ** (2.29)	0.008 ** (2.32)	0.009 ** (2.34)	0.007 (1.27)	0.007 (1.29)	0.003 (0.63)
MB Ratio	0.015 *** (5.09)	0.015 *** (5.14)	0.015 *** (5.18)	0.011 ** (2.45)	0.011 ** (2.53)	0.014 *** (2.97)
Net Charge-off Ratio	−1.499 ** (−2.09)	−1.449 ** (−2.02)	−1.483 ** (−2.01)	−4.20 *** (−3.88)	−4.364 *** (−4.03)	−4.902 *** (−4.40)
CR*NR	0.0000 (−0.01)	0.001 (0.03)	−0.004 (−0.13)	0.021 (0.46)	0.022 (0.48)	0.013 (0.27)
Time-Fixed Effects	YES	YES	YES	YES	YES	YES

** and *** denote significant at the 5%, and 1% levels, respectively.

Table 5 shows that capital ratio remains significantly positively associated with APAR, while the nonperforming assets ratio is not significantly related to announcement period abnormal returns, which is consistent with the univariate results. Among the control variables, we find net interest margin, indicative of better-performing banks [Nguyen \(2012\)](#), and market-to-book ratio, indicative of growth options, are positively related to announcement period abnormal returns. We also find a negative relationship between net charge-off ratio, indicative of low-quality loans ([Liang et al. 2013](#)), and announcement period abnormal returns.

5.2. Determinants of Longer-Term Post-SEO Abnormal Return

Table 6 reports multivariate autoregression results of longer-term abnormal returns based on different market adjustments, following the regression model below:

$$LRAR = \beta_1 * \text{Nonperforming Ratio} + \beta_2 * \text{Capital ratio} + \beta_3 * \text{Capital Ratio} * \text{Nonperforming Ratio} + \beta_i * \text{Control Variables} + \varepsilon \quad (2)$$

where LRAR denotes different long-term abnormal returns, which are the 6-month post-SEO abnormal returns over and above beta times the S&P 500 index returns, or the equal-weighted index returns or the value-weighted index returns, computed either as CAR or as BHAR. The control variables are the same as the control variable we use in regression specification (1). The table shows that the nonperforming assets ratio has a significantly negative association with LRAR, while the capital ratio does not have any significant association. Thus, the main driver of the long-run performance of banks appears to be the quality of their assets. Net charge-off ratio is significantly negatively related to the longer-term post-SEO returns, while the interaction term between capital ratio and nonperforming assets ratio is significantly positively related to the longer-term post-SEO returns. Earlier, we saw that a higher nonperforming asset ratio may require a higher capital ratio maintenance. This result may then indicate that the higher the nonperforming assets ratio, the more positive the capital ratio's effect on long-term return.

Table 6. Multivariate analysis of long-term abnormal return and bank characteristics: 6-month long term abnormal return. This table reports multivariate regression results with bootstrapped t-statistics. Dependent variables are cumulative abnormal return and buy-and-hold abnormal return 6 months after SEO over index return, value-weighted market return, or equal-weighted market return. Control variables of banks as of one quarter before SEO announcements, and time-fixed effects are included. All variables are defined in the Appendix A.

Dependent Variable:	SP CAR6	VW CAR6	EW CAR6	SP BHAR6	VW BHAR6	EW BHAR6
Nonperforming Assets Ratio	−8.139 *** (−4.57)	−8.080 *** (−4.52)	−8.3805 *** (−4.49)	−7.645 *** (−4.44)	−7.4830 *** (−4.36)	−8.156 *** (−4.61)
Capital Ratio	0.008 (1.46)	0.008 (1.40)	0.008 (1.27)	0.009 (1.64)	0.009 (1.57)	0.007 (1.27)
Loan to Assets Ratio	−0.082 (−1.04)	−0.083 (−1.04)	−0.043 (−0.53)	−0.086 (−1.13)	−0.082 (−1.09)	−0.045 (−0.58)
ROA	5.586 (1.39)	4.897 (1.21)	2.167 (0.51)	5.534 (1.42)	4.838 (1.25)	2.388 (0.60)
Net Interest Margin	−0.004 (−0.29)	−0.002 (−0.12)	0.008 (0.49)	−0.001 (−0.07)	0.001 (0.07)	0.010 (0.70)
MB Ratio	−0.006 (−0.46)	−0.003 (−0.28)	0.010 (0.75)	0.001 (0.06)	0.003 (0.25)	0.015 (1.23)
Net Charge-off Ratio	−12.159 *** (−4.15)	−12.172 *** (−4.13)	−13.718 *** (−4.47)	−11.950 *** (−4.22)	−11.795 *** (−4.18)	−13.038 *** (−4.48)
CR*NR	0.6612 *** (4.95)	0.656 *** (4.88)	0.702 *** (5.02)	0.619 *** (4.72)	0.605 *** (4.70)	0.673 *** (5.07)
Time-Fixed Effects	YES	YES	YES	YES	YES	YES

*** denotes significant at the 1% level.

What are the associations of bank characteristics one quarter before SEO with the bank performance measures 6 months and 12 months after SEO? We use the following regression specification:

$$\text{Long Term Performance} = \beta_1 * \text{Nonperforming Ratio} + \beta_2 * \text{Capital ratio} + \beta_3 * \text{Capital Ratio} * \text{Nonperforming Ratio} + \beta_i * \text{Control Variables} + \varepsilon \quad (3)$$

We control year-fixed effects in all these specifications. Table 7 shows that the nonperforming assets ratio one quarter before SEO announcement is significantly and negatively related to ROA 6 months and 12 months after SEO. The nonperforming assets ratio is also positively associated with the nonperforming assets ratio and net charge-off ratio 6 months and 12 months after SEO, while the capital ratio is not significantly associated with any bank performance measures post-SEO. The interaction term of nonperforming asset ratio and capital ratio is significantly positively related to ROA post-SEO, indicating that the higher the nonperforming assets ratio, the greater (more positive) the effect of capital ratio on long-term bank performance. Overall, Tables 6 and 7 together show that bank asset quality may be the primary determinant for banks' longer-term performance and returns post-SEO.

Table 7. Multivariate analysis of bank characteristics: one quarter before SEO and long-term characteristics. This table reports multivariate regression results with bootstrapped t-statistics. Dependent variables are return on assets (ROA), nonperforming assets ratio (NR), or net charge-off ratio (NCO), which are calculated 6 months and 12 months after SEO. Control variables of banks as of one quarter before SEO announcements, and time-fixed effects are included. All variables are defined in the Appendix A.

Dependent Variable:	ROA6	ROA12	NR6	NR12	NCO6	NCO12
Nonperforming Assets Ratio	−0.020 *	−0.027 **	1.011 ***	0.731 ***	0.041 **	0.054 ***
	(−1.83)	(−2.15)	(9.68)	(6.83)	(2.33)	(2.97)
Capital Ratio	0.000	0.000	0.000	0.000	0.000	0.000
	(−1.62)	(−1.63)	(0.35)	(−1.00)	(−0.79)	(0.52)
Loan to Assets Ratio	0.000	−0.002	0.012 **	0.007	0.000	0.001
	(−0.35)	(−3.63)	(2.49)	(1.45)	(−0.18)	(1.03)
ROA	0.7473 ***	0.794 ***	0.724 ***	0.553 **	0.091 **	0.062
	(30.26)	(26.35)	(2.95)	(2.18)	(2.16)	(1.49)
Net Interest Margin	0.000 **	0.000	0.000	0.0000	−0.001 ***	0.000
	(−2.10)	(−1.04)	(−0.38)	(0.38)	(−3.93)	(−0.37)
MB Ratio	0.000	0.000 **	−0.001	−0.002 ***	0.000 ***	0.000 ***
	(0.84)	(−2.27)	(−1.95)	(−2.81)	(−3.05)	(−1.66)
Net Charge-off Ratio	−0.008	0.032	0.155	−0.0941	0.453 ***	0.257 ***
	(−0.40)	(1.55)	(0.90)	(−0.54)	(14.01)	(8.52)
CR*NR	0.001 *	0.002 *	−0.016 **	0.000	−0.001	−0.002
	(1.66)	(1.79)	(−2.10)	(0.06)	(−0.40)	(−1.61)
Time-Fixed Effects	YES	YES	YES	YES	YES	YES

*, ** and *** denote significant at the 10%, 5%, and 1% levels, respectively.

6. Conclusions, Limitations, and Future Research

Using a dataset of 311 SEOs announcements by US Banks, from 2002 to 2017, we show that the announcement period abnormal stock-returns is significantly and positively related to the bank's capital ratio as at the time of SEO announcement, in both univariate and multivariate regression tests. However, the capital ratio does not seem to be significantly associated with post-SEO longer-term abnormal returns and performance. Instead, we show a significant negative relationship between the nonperforming assets ratio as at the time of SEO announcements, and longer-term abnormal stock returns as well as bank performance.

A couple of examples illustrate this.

The first example is that of Southern Missouri Bancorp Inc., Poplar Bluff, MO, USA. Southern Missouri Bancorp, Inc. was organized in 1994 and is the parent company of Southern Bank. In 2004, the Bank converted from a Missouri chartered stock savings bank to a Missouri state-chartered trust company with banking powers. It conducted a seasoned equity offering on 17 November 2011. The offer price was \$19 per share, and the total proceeds amounted to \$19 million. Southern Missouri Bancorp's nonperforming ratio was 0.41% one quarter before SEO announcement, which is lower than the median in our sample. Its capital ratio was 11.94% which was also below the median. Although this bank's announcement period abnormal return was −11.94% and −13.07% for the three-day and seven-day announcement period, respectively, a lower nonperforming assets ratio matters for the bank's long-term performance; therefore, its longer-term return after SEO was good. The six-month cumulative abnormal return was 9.19%, and its buy-and-hold abnormal return was 8.73%. Both numbers are higher than the median. Its nonperforming assets ratio went down to 0.36% post-six months and further to 0.34% twelve months after SEO.

The second example is that of Midsouth Bancorp Inc. Midsouth Bancorp issued seasoned equity on 7 June 2017. The offer price was \$12, and the total proceeds amount was \$50.04 million. In contrast to Southern Missouri Bancorp, Midsouth Bancorp had a higher nonperforming assets ratio one quarter before SEO announcement at 2.25%. Its capital ratio was 13.77%, more than the median ratio. Although this bank had a relatively

higher announcement period return which was 2.01% and 4.85% for three-day and seven-day announcement period returns, respectively, its longer-term return was −54.57% and −48.67% for 6-month cumulative abnormal return and buy-and-hold abnormal return, respectively. The nonperforming assets ratio continued to increase to 4.31% and 4.98% at six months and twelve months after SEO. Its ROA ratio declined from 1.32% before SEO to 1.26% twelve months after SEO.

In conclusion, as confirmed by these examples, investors perceive a higher capital ratio as indicative of safe, value-creating operations. These banks have higher announcement period abnormal stock returns around SEO announcements. However, the bank's capital ratio (as at the time of SEO announcement) is not significantly related to post-issue longer-term returns. Instead, there is a negative relationship between a bank's nonperforming assets ratio at the time of announcement and its post-issue long-term returns and performance. The main driver of the longer-run performance of banks seems to be the quality of their assets. Thus, there appears to be a disconnect between what investors look at and perceive to be an indicator of post-issue returns and performance and what the actual determinant may be.

There are limitations of our study which could be addressed in future research. Our main point is that a regulatory norm ingrained in investors' minds leads them to focus on one firm feature that they believe is a major determinant of performance when, in reality, they should be looking at some other feature. However, we have examined only one such feature that matters: the nonperforming assets ratio because of the relative opacity of banking assets. There might be other factors that may influence investor reactions and bank performances. Future studies can address some of the issues not examined in this paper.

Future studies can examine which other bank features or combinations of bank features matter for its future performance. How about the features investors pay attention to? Do investors show preferences for different bank features over time? How do the differences in capital norms over the years affect investor reactions (Qian and Strahan 2007)? Detailed investors' reaction analysis can also be an interesting topic. Elyasiani et al. (2014), for example, find that investors react negatively to private market SEOs, but positively to TARP deals. Did the financial crisis or the COVID-19 pandemic change their preferences (Çolak and Öztekin 2021)? What are the other ways in which equity-capital regulations benefit bank shareholders (Carletti et al. 2020)?

Are there any legal or policy implications of our findings (Haselmann and Wachtel 2010)? After the financial crisis of 2008, bank capital requirements have increased and have become more complex. Barth and Miller (2018a, 2018b) argue that bank supervisors cannot find a unique ratio that can always help guard against bank asset risk. They also indicate that banking financial stability depends on not just an appropriate capital ratio but other regulatory and supervisory factors. Optimal capital ratio may also be calculated using somewhat different methods in different studies, making it hard to gain full standardization (Birn et al. 2020). Our study indicates that investors should keep this in mind rather than to focus simply on a capital ratio. Other factors, such as bank payout policies, manager compensations, national culture, etc., may also influence bank risk-taking (see, for example, Mourouzidou-Damtsa et al. 2019). Our study indicates that policy makers and regulators may need to work more on investor education about bank risk.

Author Contributions: Conceptualization, methodology, review and editing: C.K.; formal analysis, investigation, writing—original draft preparation: Y.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Refinitiv’s Securities Data Company’s (SDC) Platinum Global Public Issues database; Center for Research in Security Prices (CRSP) database; and S&P COMPUS-TAT database.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Definition of Variables

Variables	Description
APAR	Announcement period abnormal stock return around bank seasoned equity offering (SEO) announcements: from −1 to +1 day, or from −3 to +3 days around the SEO announcement date, computed as stock return minus equity-beta times S&P 500 Index return, or Equal-weighted (EW) Index return, or the Value-weighted (VW) Index return of the same period, where the beta is computed by regressing the past 36 months of stock returns on S&P 500 index returns before the announcement date. (Source: daily stock price, daily market return from CRSP)
LRAR	Cumulative abnormal return of 6 months post-SEO, over and above equity-beta times S&P 500 index return, EW Index return, or VW Index return, given by: $CAR_i = \sum_k AR_{i,t+k}$ or Buy and hold abnormal return of 6 months post-SEO, over and above equity-beta times S&P 500 index return, EW Index return, or VW Index return, given by: $BHAR_i = \prod_k (1 + AR_{i,t+k}) - 1$ where AR is monthly stock return minus beta times a market index return, where the beta is computed by regressing the past 36 months of stock returns on S&P 500 index returns before the announcement date. (Source: monthly stock price, monthly market return from CRSP)
Market Value of Equity (MVE)	MVE (market value of equity) is calculated by multiplying CSHOQ and PRC, where CSHOQ (Shares Outstanding Quarterly) represents the net number of all common shares outstanding at quarter-end, excluding treasury shares and scrip, and PRC directly comes from CRSP. PRC (price) is the closing price of the same day as the report date of CSHOQ. (Source: COMPUSTAT and CRSP)
Market-to-book Ratio (MB Ratio)	MB Ratio (Market-to-book ratio, calculated by dividing MVE by stock holder equity (SEQQ). SEQQ (Stockholders Equity Quarterly) directly comes from COMPUSTAT Bank Fundamentals, and represents the common and preferred shareholders’ interest in the company. (Source: market stock price from CRSP, book value per share from COMPUSTAT)
Return on Assets (ROA), ROA6, ROA12	ROA (return on assets), for the quarter ending immediately before the SEO announcement, is calculated by dividing NIQ by ATQ, where NIQ and ATQ directly come from COMPUSTAT Bank Fundamentals Quarterly. NIQ (net income) represents the income or loss reported by a bank after expenses and losses have been subtracted from all revenues and gains, including extraordinary items and discontinued operations. This item, for banks, includes securities gains and losses, and ATQ (Assets–Total) represents the total value of assets reported on the Balance Sheet. ROA is also computed 6 months or 12 months after SEO: ROA6 and ROA12. (Source: COMPUSTAT)
Capital Ratio (CR), CR6, CR12	CR is Tier 3 capital ratio (CAPR3Q) as of the quarter ending immediately before the SEO announcement, from COMPUSTAT Bank Fundamentals Quarterly. This item represents the combined core and supplementary capital ratio calculated by adding up tier 1 capital ratio (CAPR1Q) and tier 2 capital ratio (CAPR2Q). Tier 1 capital ratio is Common Shareholders’ Equity plus Noncumulative Preferred Stock plus Minority Interest minus Goodwill minus 50 percent investment in certain subsidiaries as a percent of adjusted risk-weighted assets. Tier 2 capital ratio is Cumulative preferred stock plus qualifying debt plus qualifying allowance for credit losses minus 50 percent investment in certain subsidiaries as a percent of adjusted risk-weighted assets. CR6 and CR12 are the capital ratios (CR), 6 months and 12 months postissue. (Source: COMPUSTAT Bank Fundamentals Quarterly)

Nonperforming Assets Ratio (NR), NR6, NR12	<p>Nonperforming assets ratio is calculated, as at the end of the quarter immediately before SEO announcement, by dividing NPATQ by LGQ. NPATQ and LGQ directly comes from COMPUSTAT Bank Fundamentals Quarterly, where NPATQ (Nonperforming Assets—Total) presents the reported amount of assets that are considered nonperforming. This item includes: loans and leases carried on a nonaccrual basis; loans which are 90 days past due both accruing and non-accruing; renegotiated loans; real estate acquired through foreclosure; and repossessed movable property. LGQ (Loans—Net of Unearned Income Loans—Gross) represents the aggregate face value of all outstanding loans before the deduction of reserves for bad debt losses on loans. In some cases (most frequently after 1975), this item is reported net of Unearned Discount/Income and the Valuation Portion of Reserve for Loan Losses.</p> <p>Nonperforming Assets Ratio (NR) is also computed 6 months or 12 months after SEO: NR6 and NR12. (Source: COMPUSTAT Bank Fundamentals Quarterly)</p>
Loan to Assets Ratio (LTA), LTA6, LTA12	<p>Loan to assets ratio is calculated as total loan divided by total assets. This ratio is calculated one quarter before SEO issuance, and 6 months or 12 months after SEO issuance. (Source: total assets and total loan from COMPUSTAT)</p>
Net Interest Margin	<p>Net Interest Margin, NIMQ, from COMPUSTAT Bank Fundamentals Quarterly, is computed by dividing net tax equivalent interest income by average interest earning assets. (Source: COMPUSTAT)</p>
Net charge-off Ratio (NCO), NCO6, NCO12	<p>Net charge-off ratio is computed by dividing net charge-off NCOQ (net charge-offs) that represent the reported amount of asset write-downs minus recoveries of previous write-downs by total loan assets, by LGQ (Loans—Net of Unearned Income Loans—Gross) that represents the aggregate face value of all outstanding loans before the deduction of reserves for bad debt losses on loans. This ratio is calculated one quarter before SEO announcement and 6 months or 12 months after SEO issuance, NCO6 and NCO12. (Source: net charge-off and total loan from COMPUSTAT)</p>
CR*NR	<p>The interaction term for capital ratio and nonperforming assets ratio one quarter before SEO announcement.</p>

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