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Share Repurchase Programs by Banks

John S. Howe, Ravi Jain

Abstract

We study two motivations behind open-market share repurchases by banks. Our first hypothesis is the signaling hypothesis – banks use share repurchase announcements to signal higher future performance. Our second hypothesis is the "optimal capital ratio" hypothesis – banks use share repurchases to manage their capital ratios, and the positive announcement effect is the result of an increased value of the deposit insurance. We find that banks announcing share repurchases have a positive industry-adjusted change in ROA during the two years following the announcement, consistent with the signaling hypothesis. We also find evidence in support of our second hypothesis: banks announcing share repurchase programs experience a reduction in their capital ratios subsequent to the repurchase announcement. The reduction in capital ratios occurs without a change in the asset growth rate or dividend payout ratio. We also find that the announcement effect is positively related to the growth in capital ratios prior to the announcement and to a decrease in capital ratios subsequent to the announcement, supportive of the optimal capital ratio hypothesis.

Key words: Banks, share repurchase.
JEL classification: G21, G34, G35.

I. Introduction

The purpose of our study is to examine the motivations behind share repurchases by bank holding companies. The first motivation we test is the signaling hypothesis: managers use share repurchase announcements to signal higher future performance. The second hypothesis that we test is unique to banks: managers use share repurchases to manage their banks' capital ratios and increase the value of deposit insurance.

We find that the industry-adjusted change in ROA is positive for banks announcing share repurchases subsequent to the announcement. We also find that banks announcing repurchases experience an industry-adjusted reduction in their risk-adjusted capital ratios – TIER I and TOTAL – subsequent to the repurchase announcement. This change in capital ratios is achieved without a reduction in the asset growth or a change in the dividend payment ratio. Multivariate analysis shows that the announcement effect is greater for banks that experience an increase in capital ratios prior to the announcement and a decrease subsequent to the announcement.

Although there is a rich literature on share repurchases, a separate study of share repurchases by banks is desirable because of their unique quasi-public character. A change in the wealth of a bank not only affects its own shareholders and managers, but also affects the public interest (e.g., Chamberlain, Howe and Popper, 1997). A few failures in the banking sector might trigger a crisis of confidence. To safeguard against such a crisis, most bank debt is insured, and almost all the operational and financing aspects of banking are highly regulated. Further, banks have to maintain a minimum amount of capital to safeguard against downturns in profitability. If a bank reduces its capital, it leads to a transfer of risk from the shareholders to taxpayers, often referred to as the "moral hazard" problem. In an extreme case, a reduction in capital can lead to insolvency with larger ramifications. This characteristic makes a detailed examination of bank repurchases worthwhile. Banks also represent a large fraction of firms announcing share repurchases.

Because of their unique nature, banks have consistently been studied separately[1].

[1] For example, past studies have examined the change in debt's credit rating (Schweitzer, Szewczyk and Varma, 1992), issuance of seasoned equity (Polonchek, Slovin and Sushka, 1989; Slovin, Sushka and Polonchek, 1992), dividend cuts and omissions (Bessler and Nohel, 1996) and asset securitization (Lockwood, Rutherford and Herrera, 1996).

The payout policy of banks is highly scrutinized by investors and regulators alike. Share repurchase has become an important component of the payout policy of banks and deserves a closer examination. Thus, our study contributes to two areas of research. First, it enhances our knowledge of share repurchases, and second, it helps us understand the evolving trend in the payout policy of banks.

We examine a sample of 345 share repurchase announcements by banks from 1994 to 1998. We find that the mean (median) three-day cumulative abnormal return (CAR) around the announcement day is 1.67% (1.11%). A positive stock market reaction to a share repurchase announcement by banks is consistent with the existing literature on banks and share repurchase.

We test two possible explanations of this positive announcement effect: first, a signal for a higher future performance; second, an increase in the value of deposit insurance because of a reduction in the capital. We find evidence in support of both explanations. The mean (median) industry-adjusted change in ROA of sample banks during the period year -1 to year +2 is 0.10% (0.11%), statistically significant at the one (one) percent level. The industry-adjusted mean (median) change in the risk-adjusted capital ratio TIER I during the same period is -0.38% (-0.19%), statistically significant at the one (five) percent level. The industry-adjusted change in the risk-adjusted capital ratio TOTAL is not statistically significant during this time period. However, over the period year -1 to year +1 the mean (median) change for this ratio is -0.32% (-0.19%), statistically significant at the one (one) percent level.

Our interpretation of the results is that banks use share repurchases to manage their capital ratios. A share repurchase is preferable to an increase in dividends because a share repurchase is a flexible and cost efficient method for banks to reduce excess capital. We believe that in the case of banks, the market reacts positively to a share repurchase announcement because share repurchases lead to an increased value of deposit insurance[1].

II. Background

Share repurchase is becoming an increasingly popular way of paying out cash to the shareholders (Grullon and Michaely, 2004). Studies in this area have documented several motivations for managers to announce a share repurchase program[2]. The diverse reasons given for the use of share repurchases are not the result of a lack of consensus, but a reflection of the flexibility that share repurchases offer to managers. Dittmar (2000) states, "The decision to repurchase stock is therefore affected by the firm's distribution, investment, capital structure, corporate control, and compensation policies".

In this study, we test the signaling explanation for repurchases. We also examine a motivation unique to banks, i.e., managing capital ratios. We analyze the relation between the "moral hazard hypothesis" and share repurchase programs. Most of the liabilities of a bank are in the form of deposits. The FDIC insures bank deposits up to a limit and most of the liabilities of banks are insured. A reduction in capital increases the risk of insolvency and thus increases the value of this insurance. The increase in the value of the insurance is because there is less shareholder capital backing the claims of creditors and creditors will have to rely more on taxpayer funded federal deposit insurance in case of insolvency. Any change in the capital structure of banks which leads to a transfer of risk from shareholders to taxpayers is thus associated with a positive stock reaction.

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[1] This is consistent with Hirtle (1998) who reports that 25 largest U.S. bank holding companies used share repurchases to reduce their capital in 1997.

[2] First, firms repurchase shares when the managers believe that the shares are undervalued (Ikenberry, Lakonishok and Vermaelen, 1995). Second, firms repurchase shares because they want to signal higher future earnings (Bhattacharya, 19; Vermaelen, 1984; Miller and Rock, 1985; Ofer and Thakor, 1987; Constantinides and Grundy, 1989; Hausch and Seward, 1993). Third, firms repurchase shares to cancel the effect of the issuance of stock options (Fenn and Liang, 2001; Weisbenner, 2000). Fourth, firms use share repurchases to distribute temporary cash surpluses, while using dividend increases to distribute permanent cash flow changes (Jagannathan, Stephens and Weisback, 2000; Guay and Harford, 2000). Fifth, firms are using share repurchases as a substitute for dividends as a mechanism of cash payout (Grullon and Michaely, 2002). Finally, firms repurchase shares to reduce the agency cost arising out of free cash flows (Easterbook, 1984 and Jensen, 1986).

Our argument is consistent with the argument in Kane and Susmel (1999) who suggest a relation between share repurchases and an increase in the value of deposit insurance guarantees.

The sample period used in our study represents an important period for banks. Banks have enjoyed high and sustained profitability since the early 1990s and by the mid 1990s most banks had high capital ratios. Berger and Mester (2004) find that technological changes, increased deregulation, and consolidation in banking industry have improved the profit productivity of banks in the last decade[1]. Hirtle (1998) examines the dramatic reduction in capital ratios in 1997 for the 25 largest banks. She suggests that higher capital ratios in the mid 1990s were the result of high rate of bank failures in the late 1980s and early 1990s caused by real estate problems, and high levels of profitability in the 1990s. She suggests that the dramatic reduction in 1997 is the result of higher payouts to shareholders in form of share repurchases. Evidence in our study is consistent with her findings.

III. Data and Methods

a. Data

We use Securities Data Corporation's (SDC) database to collect our sample of open market share repurchase announcements by bank holding companies from 1994 through 1998. We start our sample period from 1994 because COMPUSTAT started reporting the Risk-adjusted capital ratios for banks in 1993. We use data for two years prior and two years after the announcement year to calculate the changes in relevant variables (discussed below). Thus, the overall time period that we use is from 1992 to 2000. The SDC database is a comprehensive database of share repurchase announcements and is often used for studies of share repurchases. The use of bank holding companies as a unit of analysis is also popular and preferred for the purpose of studying banks. Stiroh (2000) provides a detailed discussion on merits of using bank holding companies instead of individual banks.

We match our sample with Compustat database (firms with SIC code 6020) and Center for Research in Securities Prices (CRSP) database. We use the Factiva database to verify the date of each announcement and the size of the announced repurchase. We also consider more than one announcement by a single firm during the sample period. However, we only consider the first announcement in the case of more than one announcement in the same year. The final sample after matching across the databases (SDC, Compustat and CRSP) consists of 345 announcements by 184 bank holding companies.

Table 1

Year-wise distribution of announcements

This table reports the year-wise distribution of share repurchase announcements.

Year	No. of firms
1994	54
1995	66
1996	75
1997	64
1998	86

b. Methods

We conduct three main studies. First, we calculate the announcement effect, i.e., the cumulative abnormal return around the announcement date. Second, we calculate levels and changes in ROA

[1] Berger and Mester (2004) provide a useful survey of literature on changes in bank productivity.

(our measure of operating performance). Finally, we calculate levels and changes in both risk-adjusted capital ratios TIER I and TOTAL. In addition to these studies we also examine the levels and changes in asset growth and dividend payment ratio. We estimate the levels for each of these variables over a window of five years around the announcement, i.e., two years before and two years after the year of announcement. We calculate time-series changes in these variables, both at the unadjusted and industry-adjusted level. Finally, we do a multivariate analysis to explain the cross-sectional variation in the cumulative abnormal return (CAR).

Table1 reports the year-wise distribution of announcements. Table 2 reports the announcement effect of a share repurchase announcement. We calculate the announcement effect using a 3 day (-1 to +1) window around the announcement date. We use the standard market model to calculate abnormal returns. Panel A reports the CAR for the full sample of 345 announcements. Panel B reports the distribution of CAR on the basis of the size (percentage of outstanding shares) of the announcement. Panel C reports the distribution of CAR by the number of announcement (first, second, third or later).

Table 3 reports the level and changes in the operating performance of banks in our sample. We use ROA as a measure of operating performance. We adopt the method of Barber and Lyon (1996). We calculate ROA by dividing OPERATING INCOME BEFORE DEPRECIATION (Compustat Item #13) by Book value of assets (ASSETS-TOTAL Compustat Item # 6). We calculate changes both on unadjusted and industry-adjusted basis. We measure industry-adjusted changes as unadjusted changes minus the median change in a control sample consisting of all firms with same 2 digit SIC code and with an average ROA within 90% and 110% of the sample firms average ROA during years -2 to -1.

Table 4 reports the level and changes in RISK-ADJUSTED CAPITAL RATIO – TIER I (Compustat Item No. 337). Table 5 reports the level and changes in RISK-ADJUSTED CAPITAL RATIO – TOTAL (Compustat Item No. 348). Table 6 reports the level and changes in the "Growth rate of assets" (ASSETS – TOTAL, Compustat Item # 6). The growth rate of assets is the change in the book value of assets (Compustat no. 6) as a percent of book value of total assets in the previous year. Table 7 reports the level and changes in "Dividend payout ratio." Dividend payout ratio is calculated by dividing DIVIDENDS – COMMON (Compustat No. 21) by the INCOME BEFORE EXTRAORDINARY ITEMS (Compustat No. 18). We report both the unadjusted and industry-adjusted changes in these four tables, i.e., Tables 4 to 7. We calculate adjusted changes as unadjusted changes minus the median change in the control sample.

Table 8 reports the multivariate analysis. We use the abnormal return (3-day CAR) around the announcement date as the dependent variable. The explanatory variables are TIERICAPCHG-2TO0 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TIER I from year -2 to year 0), TIERICAPCHG-1TO1 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TIER I from year –1 to year +1), TOTCAPCHG-2TO0 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TOTAL from year –2 to year 0), TOTCAPCHG–1TO1 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TOTAL from year -1 to year +1), ROACHG-2TO0 (the unadjusted change in ROA from year –2 to year 0), ROACHG-1TO1 (the unadjusted change in ROA from year -1 to year +1), MB RATIOS is the market-to-book ratio, PRGNUM is a dummy variable equal to 1 if the number of announcement is third or later, and PSIZE (the size – percentage of outstanding shares – of the repurchase program). We also include year dummies, but do not report them. To avoid the problem of outliers, we set the upper- and lower-most percentiles for each variable equal to the values at the first and 99th percentiles. The standard errors used in the calculation of significance levels are heteroscedasticity adjusted by using the White (1980) method.

IV. Results

In this section we present results of our study. In the first sub-section, we discuss the announcement effect. In the second sub-section, we discuss the level and changes in operating performance.

Then we discuss level and changes in risk-adjusted capital ratios. Finally, we present the multivariate analysis to explain the cross-sectional variation in the announcement effect.

a. Announcement Effect

Table 1 reports the distribution on the basis of calendar year. The sample announcements are well distributed over the sample period, with a slightly higher number of announcements in 1996 and 1998.

Table 2 reports the three day (-1 to +1) CAR (cumulative abnormal return) around the share repurchase announcements. Panel A reports the announcement effect for the full sample. The mean (median) abnormal return for a three day window is 1.67% (1.11%), statistically significant at the one percent level. The positive market reaction is consistent but lower than the findings of earlier studies of nonfinancial firms[1].

Panel B reports the distribution on the basis of the size of the repurchase program (percent of outstanding shares). We divide the sample into two parts and predict that firms announcing a larger share repurchase program experience a more positive announcement effect. The mean (median) CAR for the large announcement size sub-sample is 2.05% (1.49%) as compared to 1.29% (0.79%) for the small announcement size sub-sample, both statistically significant at the one percent level. This difference is further supported by the multivariate analysis results reported later in this section.

Panel C reports the abnormal returns for the first, second and third (or later) announcement by the same firm during the sample period. We predict that the market reaction to be more positive for the first announcement as compared to later announcements. We find that the market reaction is lower at 0.50% (0.11%) for the third (or later) announcement, and it is also statistically insignificant at traditional levels. Jagannathan and Stephens (2003) also find a weaker stock market reaction for multiple announcements. Our multivariate analysis reported later also supports this finding.

Table 2

Cumulative abnormal return (car) around the announcement of a share repurchase program by banks

This table reports the mean and median Cumulative Abnormal Return (CAR) over -1 to 1 days relative to the announcement of an open market share repurchase by banks during 1994-1998. CRSP value weighted index is used as a benchmark to calculate abnormal returns. Median figures are reported below the mean figures for each variable. Panel A reports the CAR for the full sample of 345 announcements. Panel B reports the distribution of CAR on the basis of the size (percentage of outstanding shares) of the announcement. Panel C reports the distribution of CAR by the number of announcement. The significance levels for means are based on two-tailed t-test and the significance levels for medians are determined using Wilcoxon Signed rank test. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Panel A – Full Sample

	No. of firms		CAR (%) -1 to + 1
Full Sample	345	Mean (%)	1.67***
		Median (%)	1.11***

Panel B – On the basis of size (percentage) of the repurchase program

	No. of firms		CAR (%) -1 to + 1
Small	172	Mean (%)	1.29***
		Median (%)	0.79***
Large	173	Mean (%)	2.05***
		Median (%)	1.49***

[1] For example, Grullon and Michaely (2004) and Ikenberry, Lakonishok and Vermaelen (1995).

Table 2 (continuous)

Panel C – On the basis of the announcement number

	No. of firms		CAR (%) -1 to + 1
First	184	Mean (%)	1.86***
		Median (%)	1.40***
Second	92	Mean (%)	2.15***
		Median (%)	1.06***
Third or later	69	Mean (%)	0.50
		Median (%)	0.11

b. Operating Performance

Table 3 reports the level and changes in operating performance (as measured by ROA) for our sample banks. Panel A reports the level of ROA over the five year period (-2 to +2) around the announcement. Panel B reports unadjusted and industry-adjusted changes in ROA. The signaling hypothesis predicts that the performance should improve after the repurchase announcement. There is conflicting evidence in the share repurchase literature: Grullon and Michaely (2004) find no improvement in operating performance in post-announcement years, but Lie (2005) using quarterly data finds an improvement in operating performance subsequent to the announcement.

Table 3

Levels and changes in operating performance

This table reports the level and changes in the operating performance measure of sample banks. Panel A reports the level of Return On Assets (ROA) ratio. ROA is obtained by dividing 'operating income before depreciation' (Compustat Item No. 13) by 'total assets' (Compustat Item No. 6). Year 0 represents the year in which the firms announce the repurchase program. Panel B reports the changes in ROA on both unadjusted and adjusted basis. Adjusted changes are defined as unadjusted change minus change in the median value of firms matched on the basis of 2-digit SIC code and prior performance. The significance levels for means are based on two-tailed t-test and the significance levels for medians are determined using Wilcoxon Signed rank test. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Panel A – Level of operating performance

	Year -2	Year -1	Year 0	Year +1	Year +2
Sample					
N	322	340	323	295	256
Mean (%)	2.86***	2.90***	2.91***	2.89***	2.90***
Median (%)	2.88***	2.89***	2.90***	2.88***	2.89***

Panel B – Changes in operating performance

	Unadjusted changes			Adjusted changes		
	-2 to 0	-1 to +1	-1 to +2	-2 to 0	-1 to +1	-1 to +2
Sample						
N	305	295	256	305	295	256
Mean (%)	0.06**	-0.01	-0.01	0.07**	0.06**	0.10***
Median (%)	0.00	-0.02	-0.03	0.04**	0.04***	0.11***

Panel A reports the level of operating performance (measured by ROA) for the five year window. We do not observe any monotonic increase or decline in ROA over the five years. The mean (median) ROA at the end of year -2 and year +2 is 2.86% (2.88%) and 2.90% (2.89%), respectively.

Panel B reports the unadjusted and adjusted changes. The mean (median) unadjusted changes in the level of ROA are 0.06% (0.00%) from year -2 to year 0, -0.01% (-0.02%) from year -1 to year +1, - 0.01% (-0.03%) from year -1 to year +2. Only the mean change from year -2 to year 0 is significant at conventional levels.

We also report the industry-adjusted changes. The mean (median) industry-adjusted changes in the level of ROA are 0.07% (0.04%) from year- 2 to year 0, 0.06% (0.04%) from year -1 to year +1, and 0.10% (0.11%) from year -1 to year 2. All the adjusted changes are significant at conventional levels.

Although the unadjusted changes are not significant, the fact that industry-adjusted changes are significant suggests that banks do perform better in the post-announcement period. However, results of multivariate analysis reported later do not indicate any relation between the announcement returns and changes in operating performance.

c. Risk-adjusted Capital Ratios

Tables 4 and 5 report the level and changes in risk-adjusted capital ratios TIER I and TOTAL. We study these ratios to test our hypothesis that banks use share repurchases to manage their capital ratios and that the positive announcement effect is the result of an increase in value of the deposit insurance. We predict that banks announcing share repurchases will experience a negative change in capital ratios.

Table 4

Level and changes in risk adjusted capital ratio – Tier 1

This table reports the level and changes in the RISK ADJUSTED CAPITAL RATIO – TIER I (Compustat Item No. 337) of sample banks. Year 0 represents the year in which the firms announce the repurchase program. Panel A reports the level and Panel B reports the changes on both unadjusted and adjusted basis. Adjusted changes are defined as unadjusted change minus change in the median value of firms matched on the basis of 2-digit SIC code and prior performance. The significance levels for means are based on two-tailed t-test and the significance levels for medians are determined using Wilcoxon Signed rank test. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Panel A – Level of Capital Ratio – Tier 1

	Year -2	Year -1	Year 0	Year +1	Year +2
Sample					
N	278	335	320	290	255
Mean (%)	12.38***	12.33***	12.14***	11.72***	11.65***
Median (%)	11.71***	11.80***	11.64***	11.31***	11.30***

Panel B – Changes in Capital Ratio – Tier 1

	Unadjusted changes			Adjusted changes		
	-2 to 0	-1 to +1	-1 to +2	-2 to 0	-1 to +1	-1 to +2
Sample						
N	260	285	250	260	285	250
Mean (%)	-0.37***	-0.84***	-1.06***	-0.14	-0.45***	-0.38***
Median (%)	-0.45***	-0.67***	-0.81***	-0.26*	-0.34***	-0.19**

Panel A of Table 4 reports the level of TIER I capital ratio. The risk-adjusted capital ratio TIER I is 12.38% (11.71%) at year -2 and 11.65% (11.30%) at the end of year +2.

Panel B of Table 4 reports changes in the TIER I ratio. The mean (median) unadjusted changes in TIER I risk-adjusted capital ratio are -0.37% (-0.45%) from year -2 to year 0, -0.84% (-0.67%) from year -1 to year +1, and -1.06% (- 0.81%) from year -1 to year +2. All unadjusted changes are significant at the one percent level.

The mean (median) adjusted changes in risk-adjusted capital ratio TIER I are -0.14% (-0.26%) from year -2 to year 0, -0.45% (-0.34%) from year -1 to year +1, and –0.38% (-0.19%) from year -1 to year +2. The change from year -2 to year 0 is not significant. However, the other two changes, i.e., from year -1 to year +1 and from year -1 to year +2 are statistically significant.

We observe a similar pattern in the level and changes of the risk-adjusted capital ratio TOTAL. Panel A of Table 5 reports the level of this ratio over the five years. The risk-adjusted capital ratio TOTAL is 14.71% (13.67%) at year -2 and 13.64% (12.95%) at the end of year +2.

Table 5

Level and changes in risk adjusted capital ratio – Total

This table reports the level and changes in the RISK ADJUSTED CAPITAL RATIO – TOTAL (Compustat Item No. 348) of sample banks. Year 0 represents the year in which the firms announce the repurchase program. Panel A reports the level and Panel B reports the changes on both unadjusted and adjusted basis. Adjusted changes are defined as unadjusted change minus change in the median value of firms matched on the basis of 2-digit SIC code and prior performance. The significance levels for means are based on two-tailed t-test and the significance levels for medians are determined using Wilcoxon Signed rank test. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Panel A – Level of Capital Ratio – Total

	Year -2	Year -1	Year 0	Year +1	Year +2
Sample					
N	282	338	321	290	255
Mean (%)	14.71***	14.57***	14.31***	13.81***	13.64***
Median (%)	13.67***	13.74***	13.46***	13.00***	12.95***

Panel B – Changes in Capital Ratio – Total

	Unadjusted changes			Adjusted changes		
	-2 to 0	-1 to +1	-1 to +2	-2 to 0	-1 to +1	-1 to +2
Sample						
N	265	288	253	265	288	253
Mean (%)	-0.54***	-0.94***	-1.23***	-0.14	-0.32***	-0.19
Median (%)	-0.52***	-0.74***	-1.10***	-0.16*	-0.19***	-0.17

Panel B of Table 5 reports the adjusted changes. The mean (median) unadjusted changes in TOTAL are -0.54% (-0.52%) from year -2 to year 0, -0.94% (-0.74%) from year -1 to year +1, and -1.23% (-1.10%) from year -1 to year +2. All means (medians) of unadjusted changes are statistically significant at the one percent level.

The mean (median) adjusted changes in the risk-adjusted capital ratio TOTAL are -0.14% (-0.16%) from year -2 to year 0, -0.32% (-0.19%) from year -1 to year 0, and -0.19% (-0.17%) from year -1 to year +2. The changes from year -2 to 0 and from year –1 to +2 are not statistically significant.

However the mean (median) of adjusted changes from the year -1 to +1 is statistically significant at the one percent level.

These results suggest that in the post-announcement period, banks in our sample experience a reduction in their capital ratios. The reduction is more evident in the TIER I ratio. While the reduction in capital ratios is evident, it may be a result of a reduction in capital or a faster growth in assets. Capital itself can be reduced by higher payouts through dividends or share repurchases. Thus, we need to examine asset growth and dividend payout ratio before concluding that share repurchases are responsible for capital reduction.

Table 6 reports the level and changes in the asset growth. If the capital reduction is because of a change in the asset growth, we expect to find an increase in asset growth rate. Panel A reports the level of asset growth rate over the five years and Panel B reports changes in asset growth rate. We report both unadjusted and adjusted changes in the asset growth rate. The growth rate is 12.01% (7.98%) at the end of year -2 and 15.40% (8.94%) at the end of year +2. None of the unadjusted or adjusted changes is statistically significant at the five percent level. Banks do not experience a change in the asset growth rate in the post-announcement years.

Table 6

Level and changes in asset growth rate

This table reports the level and changes in the asset growth rate of sample banks. Asset growth rate is the change in the ASSET – TOTAL (Compustat no. 6) as a percent of book value of total assets in the previous year. Panel A reports the level of assets growth rate. Year 0 represents the year in which the firms announce the repurchase program. Panel B reports the changes on both unadjusted and adjusted basis. Adjusted changes are defined as unadjusted change minus change in the median value of firms matched on the basis of 2-digit SIC code and prior performance. The significance levels for means are based on two-tailed t-test and the significance levels for medians are determined using Wilcoxon Signed rank test. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Panel A – Level of Asset Growth Rate

	Year -2	Year -1	Year 0	Year +1	Year +2
Sample					
N	309	330	324	295	256
Mean (%)	12.01***	14.92***	15.06***	14.86***	15.40***
Median (%)	7.98***	8.95***	8.91***	8.67***	8.94***

Panel B – Changes in Asset Growth Rate

	Unadjusted changes			Adjusted changes		
	-2 to 0	-1 to +1	-1 to +2	-2 to 0	-1 to +1	-1 to +2
Sample						
N	293	285	247	292	285	246
Mean (%)	3.07	-0.14	1.31	3.11	-0.01	1.55
Median (%)	1.58*	-0.49	-0.33	1.46*	-0.67	-0.73

Table 7 reports the level and changes in the payout ratio. If banks are using dividends to reduce capital then we should find an increase in the payout ratio. Panel A reports the level of dividend payout ratio over the five years and Panel B reports changes in dividend payout ratio. The payout ratio was 32.59% (32.18%) at the end of year -2, at the end of year +2 the payout ratio was 33.58% (38.63%). None of the mean or median values of adjusted changes is significant, only median values of unadjusted changes are significant. Banks do not experience a change in the dividend payout ratio.

Table 7

Level and changes in payout ratio

This table reports the level and changes in the payout ratio of sample banks. Payout ratio is calculated by dividing DIVIDENDS - COMMON (Compustat No. 21) by the INCOME BEFORE EXTRAORDINARY ITEMS (Compustat No. 18). Year 0 represents the year in which the firms announce the repurchase program. Panel A reports the absolute level and Panel B reports the changes in payout ratio on both unadjusted and adjusted basis. Adjusted changes are defined as unadjusted change minus change in the median value of firms matched on the basis of 2-digit SIC code and prior performance. The significance levels for means are based on two-tailed t-test and the significance levels for medians are determined using two-tailed Wilcoxon Signed rank test. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Panel A – Level of Payout Ratio

	Year -2	Year -1	Year 0	Year +1	Year +2
Sample					
N	321	339	321	293	256
Mean (%)	32.59***	34.13***	34.98***	33.15***	33.58***
Median (%)	32.18***	33.31***	35.41***	36.80***	38.63***

Panel B – Changes in Payout Ratio

	Unadjusted changes			Adjusted changes		
	-2 to 0	-1 to +1	-1 to +2	-2 to 0	-1 to +1	-1 to +2
Sample						
N	303	293	255	303	293	255
Mean (%)	2.42	-0.55	-0.07	-1.18	-4.14	-5.32
Median (%)	3.01***	2.88***	4.18***	-0.80	-0.70	-1,24

The results in this section clearly suggest the use of share repurchases by banks to reduce their capital. The results also reflect their preference towards share repurchases rather than higher dividends to manage their capital.

d. Multivariate Analysis

Our final analysis is a multivariate analysis to examine the cross-sectional variation in abnormal returns around the announcement period. We use CAR (the three day cumulative abnormal return around the announcement date) as the dependent variable. Consistent with our two main hypotheses we select changes in capital ratios and changes in operating performance values to be explanatory variables. We also control for the MB ratio, the announcement number (first, second, third or later), and the size of the announced repurchase.

The explanatory variables are TIERICAPCHG-2TO0 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TIER I from year -2 to year 0), TIERICAPCHG-1TO1 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TIER I from year -1 to year +1), TOTCAPCHG-2TO0 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TOTAL from year -2 to year 0), TOTCAPCHG–1TO1 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TOTAL from year -1 to year +1), ROACHG–2TO0 (the unadjusted change in ROA from year -2 to year 0), ROACHG–1TO1 (the unadjusted change in ROA from year -1 to year +1), MB RATIOS is the market-to-book ratio, PRGNUM is a dummy variable equal to 1 if the number of announcement is third or later, and PSIZE (the size of the repurchase program – percentage of outstanding shares). We also include year dummies, but do not report them.

We predict that CAR will be positively related to an increase in pre-announcement capital ratios and negatively related to an increase in post-announcement capital ratios. Similarly, we predict that CAR would be higher for a positive change in the operating performance. We expect a nega-

tive relation between CAR and the announcement number and a positive relation between CAR and the announcement size.

Table 8

Multivariate analysis

This table gives the result of multivariate analysis. The dependent variable is CAR (cumulative abnormal returns for a 3 day window around a repurchase announcement). The explanatory variables are TIERICAPCHG-2TO0 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TIER I from year –2 to year 0), TIERICAPCHG-1TO1 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TIER I from year –1 to year +1), TOTCAPCHG-2TO0 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TOTAL from year –2 to year 0), TOTCAPCHG–1TO1 (the unadjusted change in the RISK-ADJUSTED CAPITAL RATIO – TOTAL from year –1 to year +1), ROACHG–2TO0 (the unadjusted change in ROA from year –2 to year 0), ROACHG–1TO1 (the unadjusted change in ROA from year –1 to year +1), MB RATIOS is the market-to-book ratio, PRGNUM is a dummy variable equal to 1 if the number of announcement is third or later), and PSIZE (the size – percentage of outstanding shares – of the repurchase program). The upper- and lower-most percentiles for each variable are set to equal the values at the first and 99th percentiles. The standard errors used to calculate the p-values have been adjusted for heteroskedasticity using White's (1980) procedure. *, ** and *** denote significantly different from zero at 10%, 5% and 1%.

Variable	Coefficients (p-values)	Coefficients (p-values)
INTERCEPT	0.0088 (0.5622)	0.0093 (0.5465)
TIERICAPCHG-2TO0	0.0040** (0.0212)	
TIER1CAPCHG-1TO1	-0.0041* (0.0837)	
TOTCAPCHG-2TO0		0.0037** (0.0342)
TOTCAPCHG-1TO1		-0.0026 (0.2943)
ROACHG-2TO0	-0.0047 (0.5266)	-0.0045 (0.5412)
ROACHG-1TO1	-0.0106 (0.1951)	-0.0116 (0.1701)
MB RATIO	0.0030 (0.6103)	0.0034 (0.5600)
PRGNUM	-0.0217*** (0.0015)	-0.0219*** (0.0012)
PSIZE	0.0023* (0.0519)	0.0022* (0.0572)
YEAR DUMMIES	YES	YES
N	230	230
Adjusted R^2	0.0997	0.0867
F-Value	3.54*** (0.0002)	3.17*** (0.0008)

Table 8 reports the result of multivariate analysis. We use the two capital ratios in two separate models. The results are similar for the two models. In the first model when we use changes in TIER I capital, we find that CAR is positively related to pre-announcement increase in this capital ratio (significant at the five percent level) and negatively related to post-announcement increase in the TIER I capital ratio (significant at the ten percent level). Both operating performance variables are statistically insignificant. As predicted, the coefficient of the announcement number variable is

negative (significant at the one percent level) and of the announcement size is positive (significant at the ten percent level). None of the year dummies are significant at the ten percent level.

When we use the risk-adjusted capital ratio TOTAL in the model we find similar results. The pre-announcement change in this capital ratio is positively related to CAR (significant at the five percent level) and the post-announcement change is negatively related to CAR (not significant at ten percent level). Again, the coefficient of the announcement number variable is negative (significant at the one percent level) and of the announcement size is positive (significant at the ten percent level). Again, none of the year dummies is significant at the ten percent level.

We interpret these results as a validation of our earlier finding that banks in our sample used share repurchase to manage their capital, and that the market reacted favorably because of an increase in the value of deposit insurance. However, the results of multivariate analysis weaken the earlier finding that banks experience an improvement in the operating performance in post-announcement years.

V. Conclusion

Our study looks at share repurchase announcements by bank holding companies. We provide a new and a unique motivation for repurchase programs in the case of banks. The decade of the 1980s was one of the worst for banks, but the 1990s were one of the best decades for banks. This led to higher capitalization of banks by the mid 1990s. Our results indicate that banks use share repurchases to manage (reduce) excess capital and that the market reacts favorably because of an increase in the value of the deposit insurance. Our results suggest that increasing the capital ratio of a bank beyond its optimal level is value reducing. Our study also adds to the already diverse motivations for the use of share repurchases. We support the argument that share repurchase is a flexible tool that can be used to achieve diverse objectives over different time periods, as suggested by Dittmar (2000).

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