

Bank Payout Policy, Performance, and Insider Trading in the Financial Crisis of 2007-2009

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Abstract

We provide an extensive analysis of the payout policy of U.S. banks around the financial crisis. First, while banks significantly reduce share repurchases between 2007 and 2008, they hardly reduced total dividends until 2009. Second, using established models to explain dividends, dividend payments in the crisis do not look excessive compared to banks' fundamentals in the crisis. Third, there is some heterogeneity in dividend policy; banks that do less well in the crisis reduce their dividend more than banks that fare better. Fourth, the share of banks with negative earnings increases from 16 % in 2008 to 24 % in 2009; about 50 % and 90 % of these banks reduce their dividends.. Fifth, insiders of banks that increase dividends buy less stock than do insiders of banks banks that decrease dividends in 2008 and 2009, while there is no significant difference in 2006 or 2007. Overall, our evidence is consistent with the hypothesis that bank managers underestimated the severity of the crisis, and did not see a need to cut dividends.

Keywords: dividends, total payout, financial crisis, insider trading

JEL codes: G21, G24, G28, G32,G35

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1. Introduction

Banks have long been known for paying high dividends (Kim (2011)) and their payout decisions during and after the financial crisis of 2007-09 received considerable coverage in the press (Lobb (2008), Kim (2011), Sidel (2014)). The payout policy at the beginning of the financial crisis is particularly controversial as the crisis eroded the capital of many banks, which then relied on government funding (Rosengren (2010), US Treasury (2010)). Acharya et al. (2012) document that many of the largest bank holding companies kept dividends constant and in some cases even increased them until the end of 2008, despite mounting losses. They note that it is difficult to identify the underlying reason for these banks' dividend policy.

We provide a first extensive study to shed some light on the implications and possible motives of banks' payout policy at the beginning of the financial crisis of 2007-2009. In particular, we address the following questions. To what extent does the payout policy in the financial crisis differ from the payout policy during normal times? Can bank fundamentals explain cross-sectional heterogeneity in the payout policy? What is the relation between banks' payout policy at the beginning of the crisis and the performance in the crisis? Do insider-trading patterns differ for banks that reduced or increased dividends at the beginning of the crisis?

First, we provide evidence on U.S. banks' payout policy for the period 1995 to 2012, with a special focus on the time of the financial crisis. As Floyd et al. (2015), we find that, until 2008, adjustments in payout occurred largely via share-repurchases. While banks did not considerably reduce total dividends paid to shareholders until 2009, they reduced share repurchases significantly between 2007 and 2008. The percentages of banks that increase dividends are still 46.7 % in 2007, 42.7 % in 2008, and drops to 18.8% in 2009. At the same

time, the fraction of banks that reduce dividends increases from 4.9 % in 2007 to 14.75 % in 2008 and 32.25 % in 2009.

Second, we analyze whether the dividend policy at the beginning of the crisis is “unusual”. In particular, we aim to understand to what extent the same fundamentals that explain payout policy in normal times can explain payout policy in crisis time. The most important empirical challenge is to understand what constitutes a “normal” or an “excessive” dividend policy. As a first step, we adapt the approach of Fama and French (2001) and DeAngelo et al. (2006) to model a bank’s propensity to pay a dividend. We augment their list of explanatory variables with those that reflect the different nature of the banking business from non-financials. We use data from 1995 to 2006 to estimate the propensity to pay as a function of a number of factors. The model estimated during the period prior to the crisis predicts the average propensity to pay dividends quite closely. More importantly, the model’s predicted (out of sample) propensity to pay dividends during the crisis is close to the banks’ actual propensity to pay dividends.

Next, we use the dividend per share and the dividend yield as a measure of payout policy. Our methodology is similar to the one we employ for the propensity to pay. We run an OLS panel regression with fixed effects for the period of 1995-2006 and use the estimated coefficients to obtain abnormal dividends (difference between actual and estimated dividends) for the crisis period. According to both measures of dividend payout, dispersion substantially increases after 2007. While the average abnormal dividend is zero in normal times, it becomes slightly positive in crisis times. We also recalculate abnormal dividends by fitting the same regression model in crisis time, hence allowing the coefficient to be different from normal times. Our findings

altogether suggest that a very substantial fraction of banks pursued a dividend policy that appears to be linked to their fundamentals.

Third, we examine the relationship between dividend changes and future performance in the crisis and test whether this relation is different in the crisis (2007-2008) than in normal times (1995-2006). We use two measures of performance: (i) yearly buy-and-hold return on a bank's stock and (ii) a bank's earnings scaled by total assets (cumulative net income). The relation between future performance and dividend changes is not significantly different between normal and crisis time when we use stock returns as a measure of performance. However, this relation becomes significantly stronger for 2008 when we use accounting returns. Furthermore, the effect is driven by the significantly lower future performance of banks that reduced dividends in 2008. Using the sum of dividends and share repurchases, the relation between total payout and future performance reveals similar pattern.

Fourth, we follow Acharya et al. (2012) and take a closer look at the dividend policy of banks with negative earnings. While the percentage of banks with negative earnings is around 2% prior to the crisis, this number increases ten-fold between 2006 and 2009. The percentage of banks that paid out dividends conditional on having negative income reaches 70% in 2008. While in 2007 the percentage of banks with negative earnings was very small, the majority of these banks did not reduce dividends. In contrast, in 2009, less than 3% of banks did not reduce dividends among the banks with negative earnings.

As a final analysis to explore the cross-sectional heterogeneity in the sample, we concentrate on banks with a worse than median performance in the sample and analyze their dividend policy in the crisis. We find that the worst performing banks had the highest reduction in dividends.

Fifth, we analyze the relation between insider trading and the change in dividend policy in the crisis. Again, we want to investigate, whether there is an unusual pattern that could shed light on the motives underlying banks' dividend policy in the crisis. To do so, we split the sample into those banks that increase dividends, those that increase dividends, and those that hold them constant. We do not find any difference in insider trading behavior in the three groups of banks in 2006, which is consistent with the interpretation that managers did not foresee the crisis coming (Fahlenbrach and Stulz (2011)). However, we do find significant differences for the years 2007 to 2009. The net purchase ratio of insiders of banks that increase (decrease) dividends is significantly lower (higher) than for other banks. The pattern suggests that insiders of banks that reduced dividends drive the difference in insider-trading measures for the different banks in the crisis. There might be couple of alternative explanations for the differences between the groups in 2008 and 2009, such as contrarian trading (see Jenter (2005), Piotroski and Roulstone (2006)) as well as regulatory and public scrutiny.

Acharya et al. (2012, 2013) note that banks might have continued to paying dividends because they wanted to transfer wealth to shareholders or because they feared that cutting dividends could cause refinancing problems and a bank run. Overall, our evidence is consistent with the hypothesis that bank managers underestimated the severity of the crisis until the failure of Lehman Brothers in September 2008, and did not see a need to cut dividends until then. Banks that did poorly did (eventually) reduce dividends, possibly under regulatory pressure. However, banks might still have reacted too late and reduced dividends by too little. We are missing the counterfactual to see what would have happened if banks had reduced dividends earlier. At the time where there was a larger dividend decrease, it was already clear that the regulator would bail the banks out.

Floyd et al. (2015) compare the payout policy of banks and firms from 1980 to 2012. They document that dividends play a more important role for banks than for firms and that, at the beginning of the crisis, banks reduced share repurchases but not dividends.¹ Floyd et al. (2015) argue that their findings are consistent with the idea that signaling with dividends is more important for banks than for firms since banks are more opaque. Abreu and Gulanhusssem (2013) argue that the importance of both signaling and corporate governance variables in explaining dividends increased during the financial crisis. We contribute to the discussion about the possible implications and motives underlying banks' dividend policy in the crisis by analyzing the cross-sectional heterogeneity in the payout policy and the relation to bank fundamentals, crisis performance as well as insider-trading patterns for banks that reduced or increased dividends at the beginning of the crisis.

2. Data

Our data set include listed bank holding companies (BHC) in the U.S. between 1995 and 2012. Balance sheet data and pricing data are obtained by merging different sub-databases within SNL Financial. We collect data on insider trading from Thomson Reuters, and data on stock returns are from CRSP. Overall, there are 8,195 bank-year observations with non-missing dividend data in our sample. Panel A of Table 1 shows the coverage of our panel during the sample period of 1995-2012.

– Insert Table 1 here –

The number of banks in the sample continuously increases from 228 banks in 1995 to 606 banks 2006. Unsurprisingly, we see attrition from the sample during 2008-2011.

¹ See also Hirtle (2014) for the finding that U.S. bank holding companies reduced repurchases but not dividends at the beginning of the crisis of 2007-2009.

Panel B shows descriptive statistics of all the variables we use in the empirical analysis of the paper. The average (median) bank in our sample has \$12,300 million (\$505 million) in total assets, indicating that our sample banks are considerably smaller than the ones in other empirical studies of the crisis such as Fahlenbrach and Stulz (2011), or Cziraki (2011). The average return on assets (ROA) in our sample is 0.9 %, which is comparable to the ROA value reported by the Federal Reserve Bank of St. Louis for the same period.² The average dividend to book equity is 3.19 %, and the dividend yield is 2 %.

3. Evidence on banks' payout policy from 1995 to 2012

Although the fraction of banks that pay dividends continuously decreased from above 90 % in 1995 to 76 % in 2012, Figure 1 shows that paying dividends seem to be important for banks. Indeed, even in 2008, more than 80 % of all banks in our sample pay dividends. Figure 1 also shows the fraction of banks that repurchase shares in a given year. The fraction fluctuated around 60 % until 2008 and then decreased to just above 30 % in 2009.

– Insert Figure 1 here –

Figure 2, Panel A provides evidence on the equally as well as value-weighted ratio of dividends relative to the total payout to shareholders of banks. Due to data availability on share repurchases, we look at the period after 2000. The average share of dividends to total payout (equally weighted) fluctuates around 75 % and increases to about 90 % in 2009. The value weighted dividend ratio is between 40 % and 60 % until 2007 and then increases sharply to about 90 % in 2008. The difference in payout ratios suggests that there is a difference in payout policy between large and small banks. Share repurchases were more important for large banks and these banks considerably cut back share repurchases in 2008.

² <http://research.stlouisfed.org/fred2/series/USROA>

Panel B plots the value-weighted ratio of total dividends to the banks' book value as well as the banks' market value of equity. Both ratios increase steadily until 2005. Of particular interest is the period 2007 to 2009. While dividends to book equity remain relatively stable in 2007, the ratio of dividends to market capitalization increases, as banks' stock prices started to deteriorate. In 2008, the ratio of dividends to book equity decreases, while the ratio of dividends to market increases significantly. The large drop in share prices in 2008 can explain the large increase in dividends to market equity, while the drop in dividends to book equity suggests that some banks reduced dividends or increased book equity. Both ratios decrease sharply only in 2009 and 2010.

– Insert Figure 2 here –

Looking at a balanced panel of 240 banks from 2000 onwards, we find that banks continuously increased the total amount of dividends until 2007 and slightly decreased total dividend payments in 2008. When only looking at total dividends, one could hardly identify that there was a crisis unfolding in 2007. However, banks reduced repurchases from more than \$ 21.52 bn in 2007 to \$ 3.51 bn in 2008. From 2000 to 2007, repurchases were of a similar magnitude as total payouts through dividends. Banks significantly reduced dividends only in 2009 and 2010. The fact that banks started to adjust share repurchases in contrast to dividends is consistent with the argument that dividends are “sticky” and it is easier to adjust share repurchases.

– Insert Figure 3 here –

Of course, the panel contains only banks that did not go out of business, which might give rise to the concern that it only contains banks that did well. However, only two banks drop from our total sample because of failure during the crisis. Furthermore, the panel includes banks

that were bailed out through guarantees and TARP. Indeed, 99 banks in the panel received TARP funding. Splitting the panel into banks that received TARP and banks that did not receive TARP reveals an interesting difference. The payout policy of TARP banks resembles the payout policy of the total panel, and taking out the eight largest banks that were forced to take TARP money early on does not significantly alter the picture. In contrast, non-TARP banks hardly reduced dividends during the crisis and were much slower to reduce share repurchases than banks that received TARP funding. The difference in payout policy is consistent with both non-TARP banks signaling their strength by maintaining a steady flow of dividends in the crisis as well as regulatory pressure put on TARP banks to reduce dividends after they received TARP funds. Comparing Panel B and C shows that TARP banks were larger than non-TARP banks and paid out more as a fraction of their equity (both book and market value) prior to the crisis. Panel D shows repurchases by 21 banks that never paid dividends in the balanced panel. Repurchases increased dramatically from 2007 to 2008 matching the total payout of dividend paying non-TARP banks, but fell to nearly zero in 2009. This suggests that some banks that increased dividends in 2008 kept it at the same level in 2009.

In Figure 4, we plot dividend changes over time.

– Insert Figure 4 –

The percentage of banks that increase dividends is still 46.7 % in 2007. This fraction declines to 42.7 % in 2008 and then further to 18.8 % in 2009. At the same time, the fraction of banks that reduce dividends increases from 4.9 % in 2007 to 14.75 % and 32.253 % in 2008 and 2009, respectively. The fraction of banks that keep dividends constant, decreases from 48.3 % in 2007 to 42.5 % in 2008, but then again increases to 48.6 % in 2009.

Our evidence on bank's payout policy at the beginning of the crisis is in line with the findings of Floyd et al. (2015) and confirm that the finding of Acharya et al. (2012, 2013) for large banks carry forward to a broader set of banks. The reluctance of banks to cut their dividends at the beginning of the crisis has triggered a debate about the possible reasons (Acharya et al. (2012, 2013)). One possibility is a transfer of wealth from debt holders (and in the case of a bailout, the government) to shareholders, anticipating future losses. Thereby, banks increased the severity of the financial crisis and contributed to the financial problems. Another possibility is that reducing dividends could have caused large uncertainty about the soundness of individual banks. Given the huge volume of short-term debt that banks have and continuously need to refinance, such a concern might have been a bigger problem than the payout of the dividends. A third possibility is that banks did business as usual, as they did not foresee the extent and the depth of the crisis. Hence, the huge turbulence after the Lehman bankruptcy was an unforeseen shock.

It is difficult to pinpoint which argument is correct given the missing counterfactual: banks did not reduce dividends very much early in the crisis, and those banks that did reduce dividends in 2009 and 2010, received TARP. We want to take a first step to understand to what extent fundamentals can explain banks dividend policy in 2007 and 2008. In particular, we look at whether the same factors (fundamentals) that drive banks' payout decision in normal times can equally well explain payout decisions at the beginning of the crisis. Furthermore, we analyze whether banks' responded to the crisis in different ways and whether this heterogeneity leads to differences in performance during the crisis.

4. Predicting dividend policy in the crisis

4.1. The propensity to pay dividends

A first step to analyze the question of whether banks' dividend policy at the beginning of the crisis was unusual is to ask whether a model that predicts whether a bank pays dividend before the crisis does equally well predicting whether a bank pays dividend in the crisis of 2007-08.

We choose the period between the beginning of our sample in 1995 to 2006 to calibrate our model and use it to predict dividend behavior in the crisis. Our aim is to investigate whether actual dividend behavior deviated from the prediction based on this model. If it does, depending on the direction, the reason might be that managers wanted to transfer rents to shareholders. If it doesn't, the reason might be that managers did not foresee the magnitude of the problems until the Lehman bankruptcy in October 2008.

We adapt the approach of Fama and French (2001) and DeAngelo et al. (2006) to model the probability with which a bank pays a dividend. We rely on prior literature (see Farre-Mensa et al. (2014) for a survey) to select our control variables, and we augment this list with variables that capture the essence of the banking business.

We measure profitability as the ratio of the bank's earnings (net income) to total assets (ROA). The proxies for investment opportunities are the rate of growth of total assets and the market to book ratio of equity. We use the natural logarithm of total assets to measure size. Leverage is calculated as the ratio of book equity over total assets. Liquidity is measured as the sum of cash and cash equivalents, securities held for trading, and securities available for sale, divided by total assets. We use institutional ownership (as a fraction of total ownership) to control for clientele effects (Chetty and Saez (2003)).

We add several variables to this basic specification to capture the nature of the banking business. First, different banks might follow different business models. For example, some banks have more trading business, and others might focus more on the traditional lending businesses. This may influence the volatility of earnings and the payout decision of the bank. We control for the business model of a bank using the bank's ratio of interest to non-interest (fee) income. Second, banks have to satisfy regulatory capital requirements, and banks that are close to the regulatory requirement might need to conserve cash instead of paying it out to equity holders. We capture the effect of regulation with the ratio of regulatory Tier 1+Tier 2 capital over risk-weighted assets. Third, the funding structure of banks may influence its payout policy. We control for the funding structure by including the ratio of deposit to total assets and short-term funding over total assets. We would expect that banks with a larger deposit base are more likely to pay dividends. Banks have access to the Fed Funds and Repo market through which they can exchange liquidity with other banks. This might affect their propensity to pay and the ability to increase/decrease dividends. We capture this effect through the lagged Fed Fund rate and banks' net interest income paid on Fed Funds and Repos. As Fed Funds and Repos are of extremely short maturity, the net interest income capture the use of this market throughout the year better than the outstanding funds at the end of the year.

Table 2 reports the coefficients obtained from the panel regression. Our outcome variable is a dummy that takes a value of 1 if a bank pays dividends in a given year, and 0 otherwise. Column 1 shows the results of our panel estimation using yearly data for the period of 1995-2006.

– *Insert Table 2 here* –

Larger, more profitable banks and those with a higher fraction of retained earnings are more likely to pay out dividends. Banks with more investment opportunities measured by the market to book ratio are less likely to pay dividends. Leverage is also positively associated with the propensity to pay a dividend. Regarding the specific explanatory variables for banks, banks with a higher fraction of interest to fee income are less likely to pay dividends. Banks are also more likely to pay a dividend if they have a higher risk-weighted regulatory capital ratio, and a higher net exposure to the Fed Funds and Repos market.

Panel A of Figure 5 shows the estimated and the actual average propensity to pay based on the regression Table 2. The difference is positive for the entire period. Thus, the estimated average propensity to pay is higher than the actual one. The estimated average payout probability seems to match closely the actual payout probability, not only in-sample, but also out-of-sample, after 2006.

– Insert Figure 5 here –

Based on the fundamentals that our model uses to predict dividend payer status, the predicted average propensity to pay was not very different from bank's actual propensity to pay. Hence, the model does not suggest that banks' decision to pay out a dividend in the crisis was unusual. One reason for this might be that the explanatory variables based on accounting numbers were slow to adjust and do not reflect the problems of the crisis. (As Acharya et al. (2012) argue, "the inertia in bank accounting makes even a distressed bank appear healthy...") Another reason might be that banks received money from the TARP, which made banks' fundamentals look stronger, increasing their predicted propensity to pay and reducing the distance between the average actual and predicted propensity to pay. To address these concerns, we repeat the analysis of Figure 5, Panel A discarding bank-years in which a bank has TARP

funds outstanding. By definition, this may only affect our estimates from 2008 onwards. Panel B shows the actual and estimated average payout probabilities for banks that have no TARP money outstanding. The results are quite similar to those for all banks in Panel A, which suggest that our previous conclusions are not driven by the presence of TARP banks.

In column 2 of Table 2 we characterize a bank to be payer/non-payer by also considering share repurchases. Hence, a bank is a non-payer only if it pays no dividend and does not repurchase shares. Data on repurchases are available from 2000 onwards. The significant coefficients of the control variables have the same sign as column 1. The coefficient of asset growth and contemporaneous ROA becomes significant at 5 % level, with a negative and positive sign, respectively. As share repurchases usually constitute a larger outflow of funds, there is a direct negative relation between asset growth and share repurchases.

4.2. The level of dividends

An alternative way to characterize banks' dividend policy is to look at the level of dividends. As for the propensity to pay, we use a panel regression from the years prior to the crisis to estimate how much dividends banks distribute as a function of bank specific variables. We then compare actual with predicted values by using the coefficients of the regression estimated in normal times. In addition, we also re-run the same regressions using only the crisis years of 2007-08. Thus, we calculate abnormal dividends also in sample. The weights of fundamentals in determining payouts may change from normal times to crisis times and this may affect our conclusion on whether banks paid out too much during the crisis.

Our universe of banks includes banks that paid dividends at least once during our sample period. We use dividend per share and the dividend yield as outcome variables. In untabulated results,

we repeat the same analysis, replacing dividends by total payout (sum of dividends and share repurchases) and we obtain qualitatively similar results.

Table 3 reports the results. In columns 1 to 4, our outcome variable is dividend per share; in column 5 and 8, it is the dividend yield. Column 1, 2, 5 and 6 reports the coefficients of regressions for normal times. Column 3, 4, 7, and 8 displays the coefficients from running the regression in crisis times. To capture time-invariant unobserved heterogeneity at the bank level, including differences in the number of shares outstanding, we estimate regressions with bank fixed effects (FE) (columns 1, 3, 5, 7). However, we also reports the coefficients of the regression without bank fixed effects (columns 2, 4, 6, and 8).

Banks dividends are determined by size, lagged profitability and leverage in normal times (column 1). Banks pay higher dividends per share if they are larger, had a larger past profit, and have higher leverage. The coefficients for the dividend yield in normal times (column 5) are similar in sign and significance to the ones for dividends per share, except for the coefficients of the Fed Fund rate and deposit funding. A larger deposit funding is associated with lower dividend yield. A larger Fed Fund rate is associated with higher dividend yield. A possible reason for the positive association is a negative correlation of the Fed Fund rate with banks' share prices as the Fed Fund rate increases when the market tightens. As lower share prices increase the dividend yield, we get a positive association between the dividend yield and the Fed Fund rate. In addition, a higher current profitability is associated with a lower dividend yield, which can also stem from a positive relation between profitability and stock price. A higher fraction of liquid assets is associated with higher dividend yield.

– Insert Table 3 here –

Column 3 of Table 3 shows the coefficients of the regression estimated for 2007-2008 with fixed effects. Comparing the coefficients to the ones we obtain in normal times, we see several differences. In particular, the role of size and past profitability in determining dividends is significantly diminished. At the same time, the importance of current profitability (ROA) and the business mix of the banks significantly increased. In particular, banks with higher current profitability and more traditional business mix pay out higher dividends. It is also important to observe that the predictive power of the dividend per share regression with fixed effects goes down from 22% in normal times to 9% in crisis times.

Column 7 of Table 3 displays the coefficients of dividend yield regressions estimated in crisis times. While the importance of size, contemporaneous profitability and liquidity in determining dividend yield goes down in crisis times compared to normal times, the importance of past profitability increases.

Figure 6, Panel A shows the average level of abnormal dividends for 2000 onwards, defined as the difference between actual and predicted dividends for the entire period (including in sample and out of sample), using the estimated coefficients from Table 3, column 1.

– Insert Figure 6 here –

As dividends in TARP banks follow different dynamics than those in non-TARP banks, we separately plot the average abnormal dividends for non-TARP and TARP banks from 2008 onwards. The average level of abnormal dividends per share is low and oscillates around zero for most of the in-sample period. It increases slightly at the onset of the crisis and decreases almost to zero in 2008, and then becomes negative in 2009. For TARP banks, the average abnormal dividend is negative throughout our sample period with a large negative spike in 2009. Thus, TARP banks considerably reduced dividends below the model's prediction. Again, either the

model does not capture the fundamental problems of these banks, or regulatory pressure on TARP banks is underlying the reduction of dividends.

Panel B shows that the standard deviation of abnormal dividends for non-TARP banks is almost constant during the entire in-sample period, while it slightly increases during the crisis years. The standard deviation of abnormal dividends is higher for TARP banks than for non-TARP banks and remains much higher until the end of the sample period.

In Panel C and D, we plot the average abnormal dividend yield as well as its standard deviation for all banks in the sample, splitting again non-TARP and TARP banks after the third quarter of 2008. The average abnormal dividend yield is very close to zero 0 until 2006 and then increases dramatically, in particular, in 2008. It is significantly larger for TARP banks in 2008 than for non-TARP banks, but rapidly plunges for TARP banks afterwards, reaching negative values after 2009. A comparison of Panel A and Panel C suggests that the discrepancy in 2008 is due to decreasing stock prices, not increasing dividends. The standard deviation of the abnormal dividend yield is higher for TARP than for non-TARP banks.

The average abnormal payout can hide substantial heterogeneity in dividend payout. In Figure 7, we look at abnormal dividends per share by quantiles throughout our sample period. In particular, the red line shows the density plot of the abnormal dividends estimated in sample for the period of 1995-2006, with fixed effects. In Panels A and B, in green we display abnormal dividends estimated out of sample for 2007, 2008, separately. Both panels show a much larger dispersion of abnormal dividends as well as fatter tails both in the negative and in the positive during 2007-2008 compared to 1995-2006. In 2007 and 2008 the average abnormal dividend per share is slightly positive, while it is zero in normal times. The difference in the average dividend per share is around 7 cent in 2007, and even lower in 2008.

The blue line in Panel A and B shows the abnormal dividends estimated in sample for 2007 and 2008, respectively, using the regression coefficients displayed column 3 of Table 3. The average abnormal dividend is around zero for both years, but there is more dispersion in 2008 than in 2007.

We perform a test to understand whether the model used to evaluate banks' dividend policies alters our view of abnormal dividends. In particular, for each bank, we predict the abnormal dividends in 2007 and 2008 both in sample, using the coefficient estimates for 2007-2009, and out of sample, using the coefficient estimates from the period 1995-2006. Then, we test whether the in-sample and out-of-sample residuals are equal to one another. (These tests are untabulated.) We find that the in-sample residuals are significantly lower than the out-of-sample residuals (the average of the blue distribution is lower than the average of the green distribution) for 2007, but not for 2008. These differences between in-sample and out-of-sample residuals highlight that banks may have altered the model underlying their dividend behavior during the crisis, and that taking this into account may help understand whether their dividend payments were excessive or not. Another look at the table that underlying these graphs, i.e. Table 3 reveals that while dividend policies seem to depend on past profitability and not on current profitability in normal times, the latter significantly shapes decisions in crisis times. This in turn can explain why dividend policies seem more off to the right when we use a model calibrated normal times than one that is estimated in crisis times.

The previous graphs altogether suggest that a substantial fraction of banks pursued a dividend policy that still appears to be linked to their fundamentals, and even banks with positive abnormal dividends seem not to be too far from the zero abnormal dividends.

– Insert Figure 7 here –

5. Payout policy and crisis performance

In this section, we explore the relationship between a bank's payout policy, the bank's performance in the crisis. The payout literature on non-financials examines the information content of dividends (Benartzi et al. (1997), Grullon et al. (2002)), in particular whether dividend changes reflect past or future performance. We now address the question whether the relation between dividend changes and future performance was different during the crisis compared to normal times. We use two measures of crisis performance. First, following, Fahlenbrach et al. (2012), we use the dividend-adjusted buy-and-hold return on a bank's stock. Second, we use the sum of the bank's earnings by total assets (cumulative net income). We use both a market and an accounting measure of performance to ensure that our choice of performance measure does not drive the results. The market might overreact to news and, in particular, changes in dividends: investors might interpret a reduction in dividends as negative signal so that the share price decreases. An accounting measure of crisis performance avoids this problem, but managers might delay reporting negative news.

To assess the changes in bank dividend policies over time, we employ two dummy variables: one for the crisis period of 2007-08 and a second dummy for the post-crisis period 2009-12³ The coefficient of the interaction term between the dividend change and the time dummies reflects the difference between normal times (i.e., 1995-2006) and the crisis and post-crisis periods with regard to the relationship between dividend changes at year t and future

³ In this section, we do not use the dividend yield. First, we are interested in dividend changes that stem from managerial decisions, not stock price movements. Second, a large fraction of banks had negative net income in the crisis, making it difficult to interpret the dividend payout ratio. Whenever we analyze changes in dividends, we exclude banks that never paid a dividend. For banks that stopped paying a dividend, we set the dividend change equal to zero in years where this bank does not pay a dividend in two consecutive years. Our results do not change if we leave the banks in the sample that never pay a dividend and set the dividend change equal to zero in all years.

performance at year $t+1$. Columns 1 and 3 in Table 4 display the relation between dividend change and future performance without controls, while columns 2 and 4 are with controls. The relation between future performance and dividend changes is not significantly different between normal and crisis time when we use stock returns as a measure of performance. On the contrary, this association becomes significantly stronger in crisis time when we use accounting returns: *ceteris paribus* larger dividend increases (decreases) are associated with higher (lower) future accounting performance.

– *Insert Table 4 here* –

In Table 5, we only focus on the crisis years to see where the significant relation between dividend changes and future performance comes from. This relation is positive and significant at the 1 percent level for both measures of performance for 2008, but not in 2007. To understand whether the relation between dividend change and crisis performance differs for reductions and increases of dividends, we replace the change in dividends by dummies for positive and negative dividend growth.

Panel B of Table 5 reports the results. We find that banks that reduced dividends in 2008 performed significantly worse in accounting terms in 2009 than other banks. For 2007 we fail to detect any significant relationship between dividend changes and performance in 2008.

– *Insert Table 5 here* –

As a robustness check, similar to Fahlenbrach et al. (2012), we define the crisis period from the third quarter of 2007 to the last quarter of 2008, and look for the correlation between crisis performance and dividend changes in 2007 and 2008. As managers might delay reporting negative news, we extend the measurement of ROA until the last quarter of 2009. The estimation results, displayed in Table 6 are consistent with our previous findings. We detect a

strong positive correlation between dividend changes and crisis performance only for 2008, but not for 2007.

The overall evidence suggests a stronger association between future performance and dividend changes in 2008 than normal times. In particular, banks that performed worse in 2009 made larger downward adjustments in dividends in 2008. Hence, this finding does not seem to support the argument that banks in anticipation of worse performance increased the distribution of dividends.

– Insert Table 6 here –

Table 7 Panel A displays the relation between future returns and total payout changes which include dividends and share repurchases. As good data coverage is only available from 2000 onwards about repurchases, we use 2000-2006 as normal times when we code our regressions. Similarly to Table 4, the association between total payout change and future performance during the crisis becomes stronger when we measure performance by the ROA. Both the simple as well as the conditional correlation between future accounting performance and total payout change is positive and significant at the 1 percent level.

– Insert Table 7 here –

In Table 8 we split the crisis period into years similarly to Table 5. This analysis, reveals similar patterns to the one in Table 5. The relation between 2008 dividend and 2009 ROA is positive and significant at the 1 percent level. No such correlation exists between total payout changes in 2007 and performance in 2008.

– *Insert Table 8 here* –

6. Dividend policy and negative earnings

, several banks paid dividends despite making losses. In Figure 8, we look at the prevalence of such a dividend policy. Panel A shows the percentage of banks (out of total banks in our sample) that pay dividends despite having negative net income during 2000-2012. While the percentage of banks with negative income is around 2% prior to the crisis, this number increases by ten-fold between 2006 and 2009. Before the crisis, 10 % to 40 % of banks that make a loss pay dividends, which, given the low number of loss making banks prior to the crisis, corresponds to a very small number of banks. In 2006, this ratio increases to 60 %, and reaches 70 % in 2008. These patterns confirm that a large fraction of banks continued to pay dividends despite making losses in 2007 and 2008.

– *Insert Figure 8 here* –

Banks may continue paying dividends despite making a loss if they expect the negative net income to be temporary, and they want to signal this belief to the market. An alternative explanation is that banks continue to pay dividends to transfer funds to their shareholders, possibly, in anticipation of a bailout if the situation gets worse.

In Panel B, we split the sample of banks with negative earnings into 3 subsamples: (1) banks with positive dividend growths; (2) banks with unchanged dividends; (3) banks with negative dividend growth. The graphs shows that while in 2007 the overall percentage of banks with negative earnings was very small (roughly 3 percent), the majority of banks did not reduce dividends. This ratio increased disproportionately with an increase in the number of banks with

negative earnings. In 2009, less than 3% of those banks with negative net income did not reduce dividends.

As a robustness check, we also plot the relationship between performance and dividend changes for banks that perform worse than the sample median. Thus, we look at the left tail of the distribution. Similarly to our regressions, we look at both stock and accounting measures of performance. Panel A and B of Figure 9 show that for both performance measures worse performing banks had a lower dividend increase than better performing banks. Furthermore, even banks at the 50% percentiles had a close to zero dividend growths, and banks in lower quartiles did reduce dividends.

– *Insert Figure 9 here* –

7. Dividend policy and insider trading

In this section, we analyze the relationship between insider trading and the change in dividend policy. The objective is again to identify unusual behavior and to see whether the evidence can shed light on whether bank managers might have anticipated future bad performance. To do so, we split banks into three groups and show insider-trading measures for these three groups. The first group consists of banks that decrease their dividends, the second group consists of banks that increase their dividends, and the third group consists of banks that do not change their dividends.

We rely on prior literature to select variables to measure insider trading and, in particular, whether insiders are purchasing or selling. The variable *NPR count* is the average net purchase ratio calculated as the ratio of net purchases to total insider transactions, $\frac{\text{number of purchases} - \text{number of sales}}{\text{number of purchases} + \text{number of sales}}$ (Lakonishok and Lee (2001)). This measure equals +1 if all

insider trades are purchases and -1 if all insider trades are sales. *NPR volume* uses the number of shares bought and sold as opposed to the number of purchases and sales (Lakonishok and Lee (2001)). Finally, we also examine the percentage of net buyers, defined as insiders who buy more stock than they sell (Jenter (2005), Cziraki (2011)). All three measures increase with more insider buying and decrease with more insider selling. To control for bank-specific, time-invariant heterogeneity in insider trading behavior of banks, which might stem from differences in firm-level insider trading policies (Roulstone (2003)) or governance arrangements (Ravina and Sapienza (2010), Cziraki et al. (2014)), we de-mean the insider-trading measures. We calculate the de-meaned values by taking the time-series average of the variable for each bank in normal time and then subtract this average from each of the observations.

– *Insert Table 9 here* –

Table 9, Panel A shows the averages of the (de-meaned) insider-trading measures for each of the three groups of banks around the crisis. There is no significant difference between the three groups in 2006, 2010, and 2012.⁴ In contrast, for 2007 to 2009, we find significant differences for the three insider-trading measures for the three groups. In particular, the net purchase ratios as well as the percentage of net buyers for insiders of banks that increase (decrease) dividends are significantly lower (higher) than for other banks. The evidence suggests that insiders of banks that increased dividends were more pessimistic about their banks' prospects than other banks' insiders were about their banks.

Panel B shows the dynamics of the three insider-trading measures around dividend changes for the entire sample from 1995 to 2012. The insider-trading measures are shown in event time, in the 7 years around the dividend decision. Year 0 is the year in which the dividend

⁴ The finding is consistent with the interpretation that managers did not foresee the crisis in 2006, which is in line with the conclusion of Fahlenbrach and Stulz (2011).

is paid. These results show that the significant difference of insider trading patterns for banks with different payout policy are specific to the crisis of 2007-2009. We do not find the same insider-trading patterns for banks in outside the crisis. If anything, insider buying intensifies in the year of a dividend increase and decreases in the following year.

In Figure 10, we plot the results of Table 9, Panel B.

– Insert Figure 10 here –

Looking at the figure, the insider-trading measures for banks that reduce dividends are very different from the insider trading-measures in previous years, while insider-trading measures for banks that increase dividends is comparable to previous years. The pattern suggests that insiders of banks that reduced dividends drive the difference in insider-trading measures for the different banks in the crisis. However, insider-trading measures of banks that did not change their dividend did also change considerably in the crisis, and taking these measures as a reference (to account for the differences between the crisis and normal times), banks that increase dividends and banks that decrease dividends both deviate from this reference point in different directions.

There are alternative explanations for the differences between groups in 2007 and 2008. One explanation is contrarian trading. Banks that reduced probably experienced a stronger decline in share price than banks that increased dividends. Insiders of banks that experienced a sharp decline in share price might buy more and sell less betting on a recovery of the share price (see Jenter (2005) and Piotroski and Roulstone (2006)). An alternative explanation is that insiders of banks that received TARP were under greater public and regulatory scrutiny than banks that did not receive TARP and increased dividends. The insiders of banks that received TARP and reduced the dividend are therefore less likely to sell shares.

8. Conclusion

We provide a systematic study of the payout behavior of banks around the recent financial crisis for a large sample of U.S. banks. We find that banks show considerable heterogeneity in their payout policy and in their reaction at the beginning of the financial crisis of 2007-2009. We employ standard models of dividend policy and use the prediction of these models as a reference to determine whether banks altered their payout behavior in crisis time in an unusual way. We find no significant change in the explanatory power of the model in and out-of-sample. Based on these models, it is not possible to conclude that banks' decision in the crisis to pay out a dividend was unusual.

Looking at the relation between dividend changes and future performance reveals that the association became stronger during the crisis. In particular, banks with worse future performance in 2009 cut back dividends by more in 2008. This finding is not consistent with banks anticipating bad performance paying out more in an attempt to reduce creditors' claim.

References

- Acharya, V.V., Gujral, I., Kukarni, N., and Shin, H.S., 2012. Dividends and bank capital in the financial crisis of 2007-2009, Working Paper.
- Acharya, V.V., Le, H., Shin, H.S., 2013. Bank capital and dividend externalities, Working Paper.
- Acharya, V.V., Pedersen, L.H., Philippon, T., and Richardson, M., 2010. Measuring systemic risk, Working Paper.
- Babenko, I., Tserlukevich, Y., Vedrashko, A., 2012. The credibility of open market share repurchase signaling, *Journal of Financial and Quantitative Analysis* 47, 1059-1088.
- Benartzi, S., Michaely R., Thaler, R.H., 1997. Do changes in dividends signal the future or the past?, *Journal of Finance* 52, 1007-1034.
- Chetty, R., Saez, E., 2005. Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut, *Quarterly Journal of Economics* 120, 791-833.
- Cziraki, P., 2011. Trading by bank insiders before and during the 2007-2008 financial crisis, Working paper.
- Cziraki, P., de Goeij, P., Renneboog, L., 2014. Corporate governance rules and insider trading profits, *Review of Finance* 18, 67-108.
- DeAngelo, H., DeAngelo, L., Stulz, R.M., 2006. Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory, *Journal of Financial Economics* 81, 227-254.
- Duchin, R., Sosyura, D., 2014. Safer ratios, riskier portfolios: banks' response to government aid, *Journal of Financial Economics* 113, 1-28.
- Fahlenbrach, R., Prilmeier, R., Stulz, R.M., 2012. This time is the same: using bank performance in 1998 to explain bank performance during the recent financial crisis, *Journal of Finance* 67, 2139-2185.
- Fahlenbrach, R., Stulz, R.M., 2011. Bank CEO incentives and the credit crisis, *Journal of Financial Economics* 99, 11-26.
- Fama, E.F, French, K.R., 2001. Disappearing dividends: changing firm characteristics or lower propensity to pay?, *Journal of Financial Economics* 60, 3-43.
- Farre-Mensa, J., Michaely, R., Schmalz, M., 2014. Payout policy, Working paper.
- Floyd, E., Li, N., Skinner, D. J., 2015. Payout policy through the financial crisis: The growth of repurchases and the resilience of dividends, *Journal of Financial Economics*, forthcoming.
- Gao, G., Ma, Q., 2012. The sound of silence: what do we know when insiders do not trade, *Working paper*.
- Grullon, G., Michaely, R., Swaminathan, B., 2002. Are dividend changes a sign of firm maturity?, *The Journal of Business* 75, 387-424.

- Hirtle, B., 2014. Bank holding company dividends and repurchases during the financial crisis, Federal Reserve Bank of New York, Staff Report No. 666.
- Jenter, D., 2005. Market timing and managerial portfolio decisions, *Journal of Finance* 60, 1903-1949.
- Kim, J.J., 2011. Banking on bank dividends, *The Wall Street Journal*, 12 March.
- Lakonishok, J., Lee, I., 2001. Are insider trades informative?, *Review of Financial Studies* 14, 79-111.
- Li, W., Lie E., 2006. Dividend changes and catering incentives, *Journal of Financial Economics* 80, 293-308.
- Lobb, A., 2008. Investors lick wounds from dividend cuts, *The Wall Street Journal*, 8 November.
- Marin, J.M., Olivier, J.P., 2007. The dog that did not bark: insider trading and crashes, *Journal of Finance* 63, 2429-2476.
- Ravina, E., Sapienza, P., 2010. What do independent directors know? Evidence from their trading, *Review of Financial Studies* 23, 962-1003.
- Rosengren, E.S., 2010. Dividend policy and capital retention: a systemic “first response”, presented at “Rethinking Central Banking” Conference, Washington, D.C., 10 October.
- Roulstone, D.T., 2003. The relation between insider-trading restrictions and executive compensation, *Journal of Accounting Research* 41, 525–551.
- Sidel, R., 2011. Rejuvenated banks raise dividends, *The Wall Street Journal*, 2 May.
- United States Department of the Treasury, 2010. Troubled Asset Relief Program: Two Year Retrospective, available at: http://www.treasury.gov/initiatives/financial-stability/reports/Documents/TARP%20Two%20Year%20Retrospective_10%2005%2010_transmittal%20letter.pdf

Figure 1: Percentage of banks by payout status

Data from bank dividend payments are from SNL. Panel A shows dividend payers and repurchasers. Each year we sum the quarterly dividend payments of each bank, and categorize a bank as a payer if the total amount is positive. Similarly, we categorize a bank as a repurchaser if the sum of quarterly repurchases is positive in a given year. Panel B shows dividend changes. We calculate dividend changes based on annual dividend per share. The data span 1995-2012 for dividends and 1999-2012 for repurchases.

Panel A: Dividend payments and repurchases over time

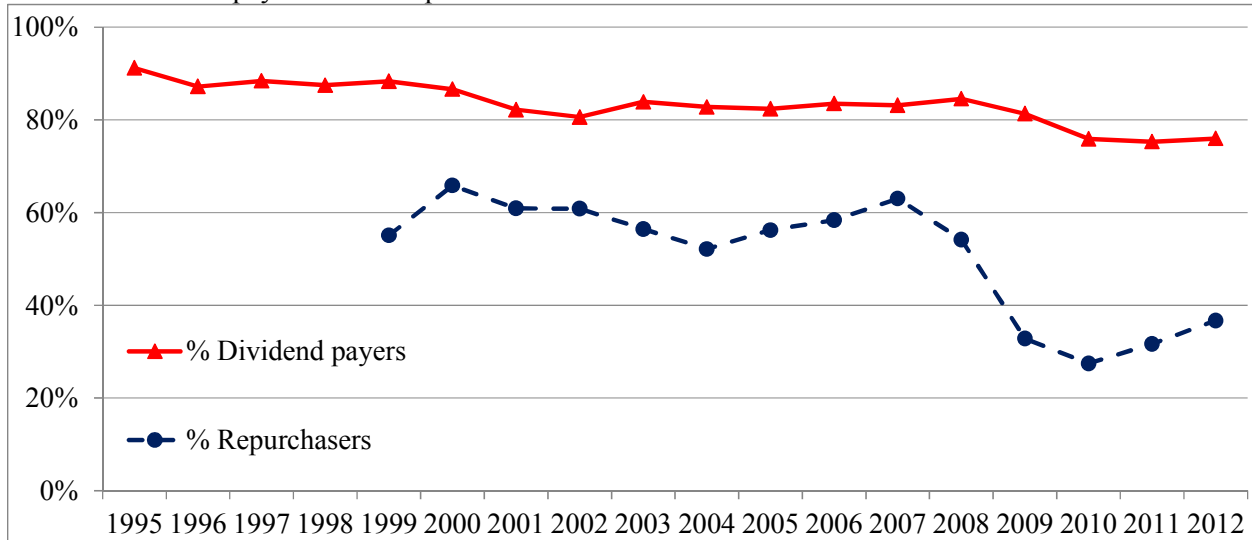
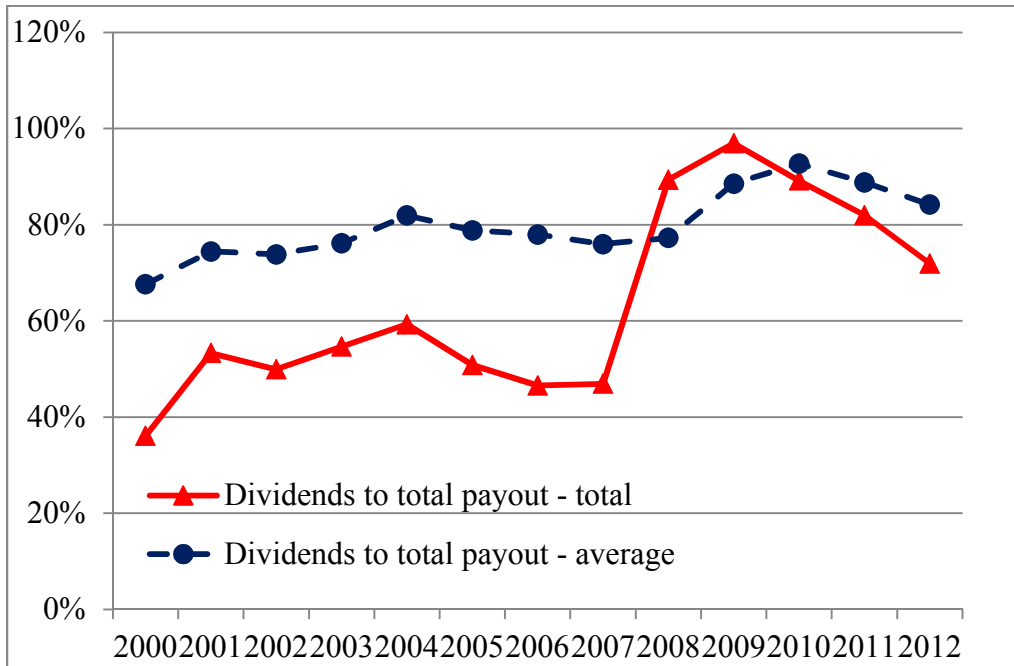


Figure 2: The level of bank dividends over time

Dividend measures for our sample banks over time. Panel A shows the aggregate dividends across all our sample banks divided by the aggregate amount of total payout and the average ratio of dividends to total payout across our sample banks. In Panel B the dotted line shows the ratio of aggregate dividends to aggregate book equity, and the dash-dotted line shows the ratio of aggregate dividends to aggregate market capitalization. Data from bank dividend payments are from SNL. The data span 2000-2012.

Panel A:



Panel B:

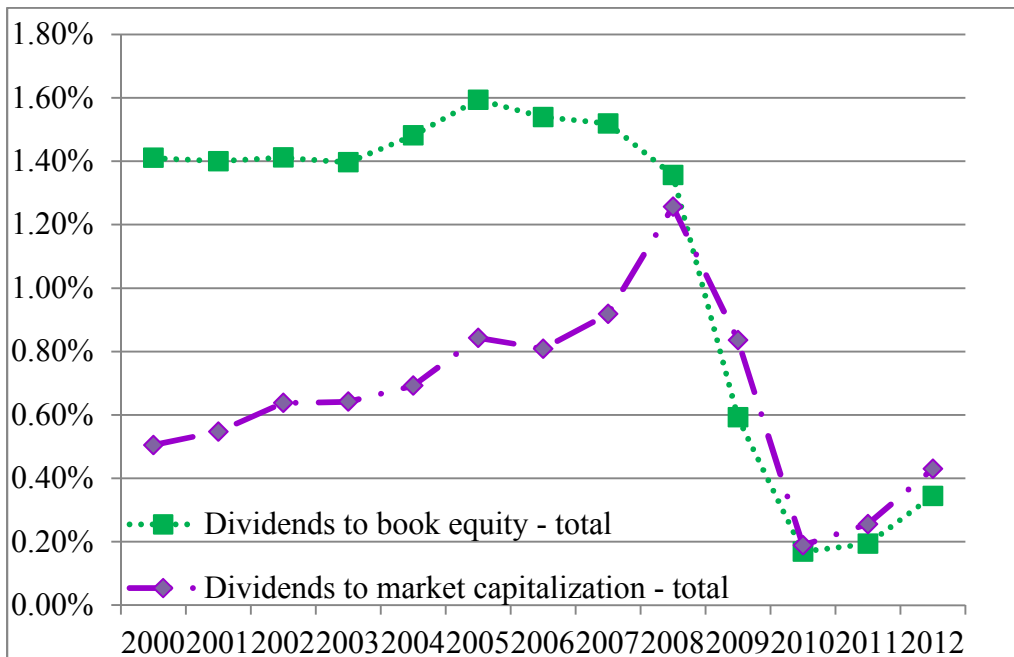
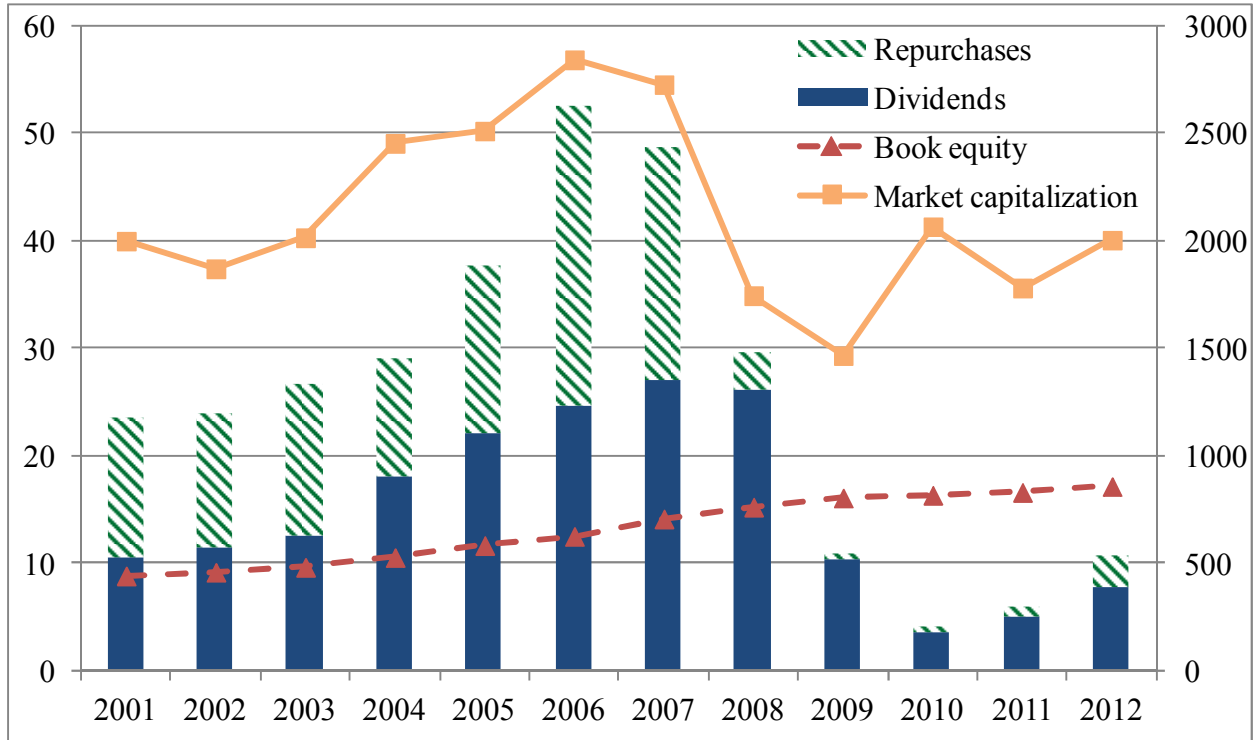


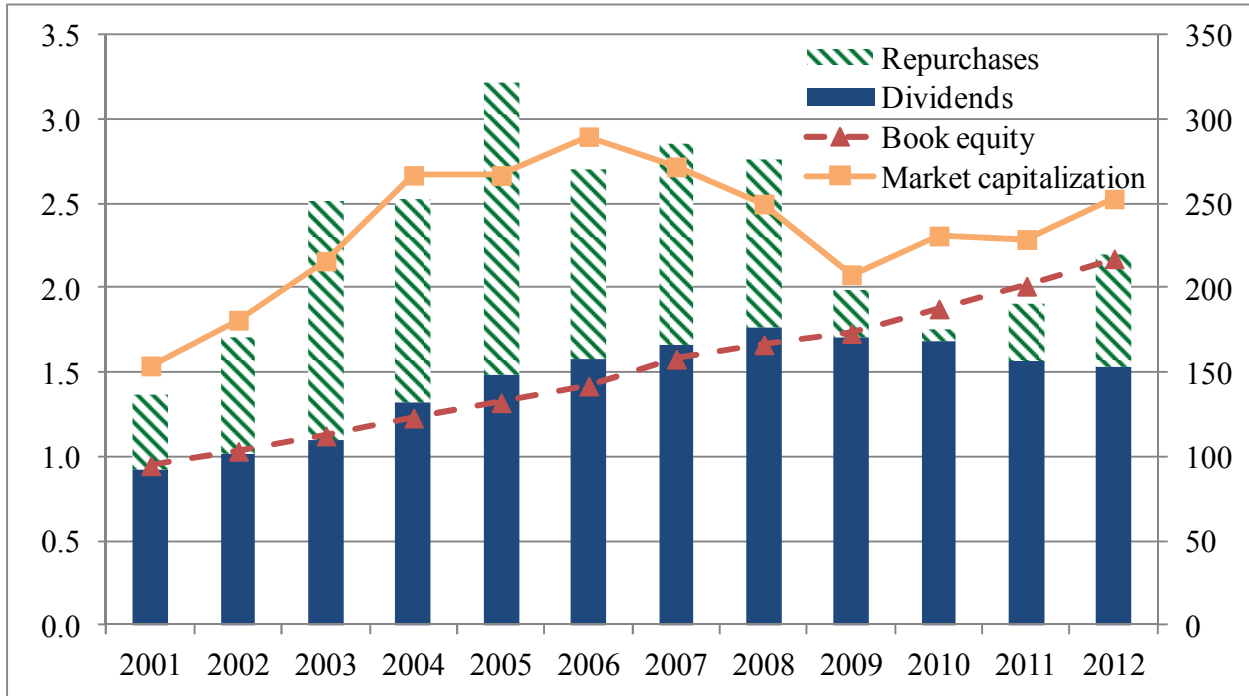
Figure 3: The dynamics of bank payout over time in a balanced panel

Data from bank repurchases are from SNL. The figures show a balanced panel of 240 banks with information on payout available through 2001-2012. Each year we sum the total amount of dividends and the total amount of repurchases of these banks. The dollar value of dividends and repurchase is measured in billions on the left vertical axis. The lines show how the total assets and market capitalization of these banks evolves over time. The dollar amount is measured in billions on the right vertical axis. Panel A shows all banks in the balanced panel. Panel B shows only banks that never received TARP funding, and Panel C shows only banks that received TARP funding.

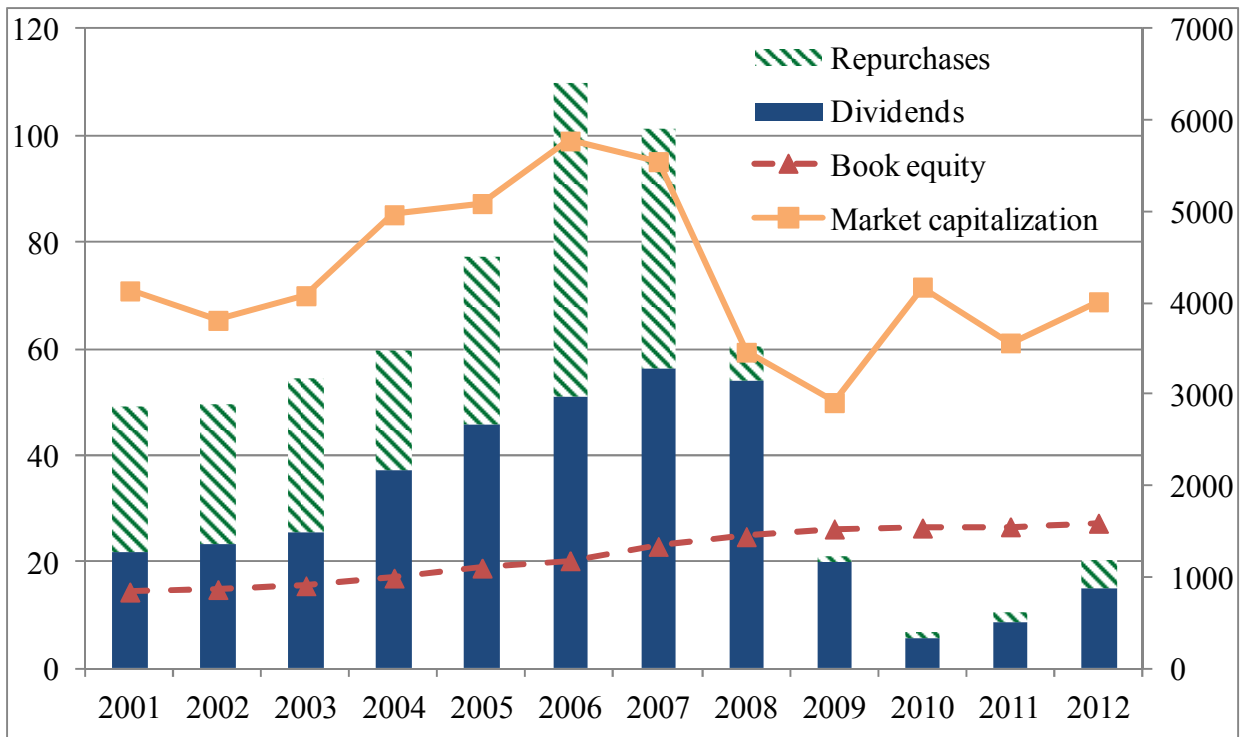
Panel A: All 240 banks in the balanced panel



Panel B: Banks that did not receive TARP funding (N = 141)



Panel C: Banks that received TARP funding (N = 99)



Panel D: Banks that never paid

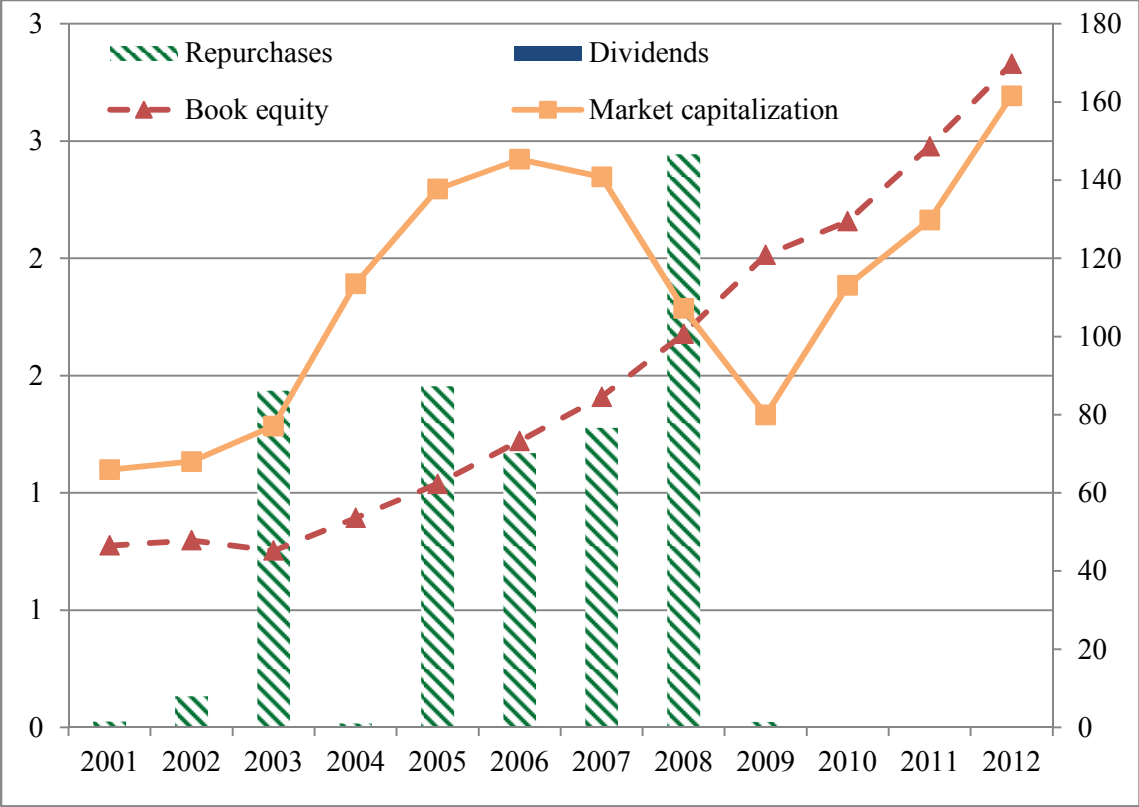


Figure 4

Changes in dividends over time

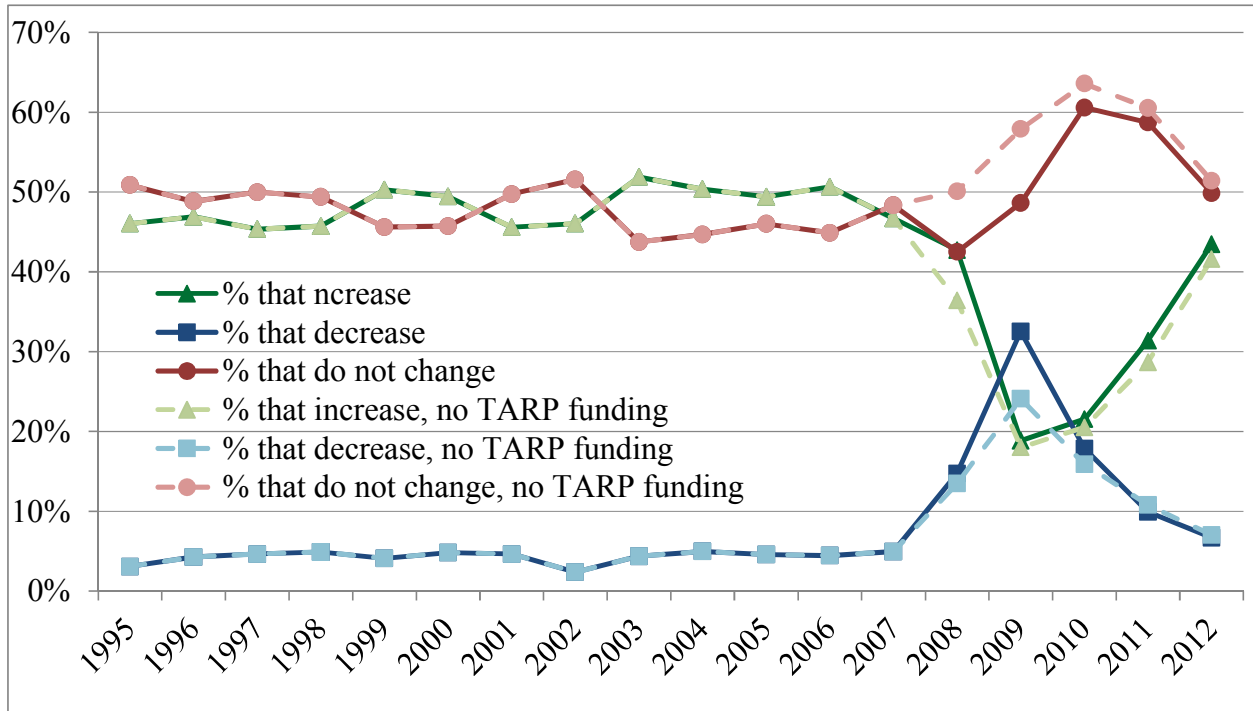


Figure 5: Predicted and actual propensity to pay

The graphs show actual dividend payment frequency and predicted propensity to pay based on the model estimated in Column 1 of Table 2, during the period 1995-2006. Panel A shows the actual and predicted probabilities (top) and the difference between them (bottom) for the whole sample. Panel B shows graphs discarding bank-years in which a bank had TARP funds outstanding.

Panel A. Full sample

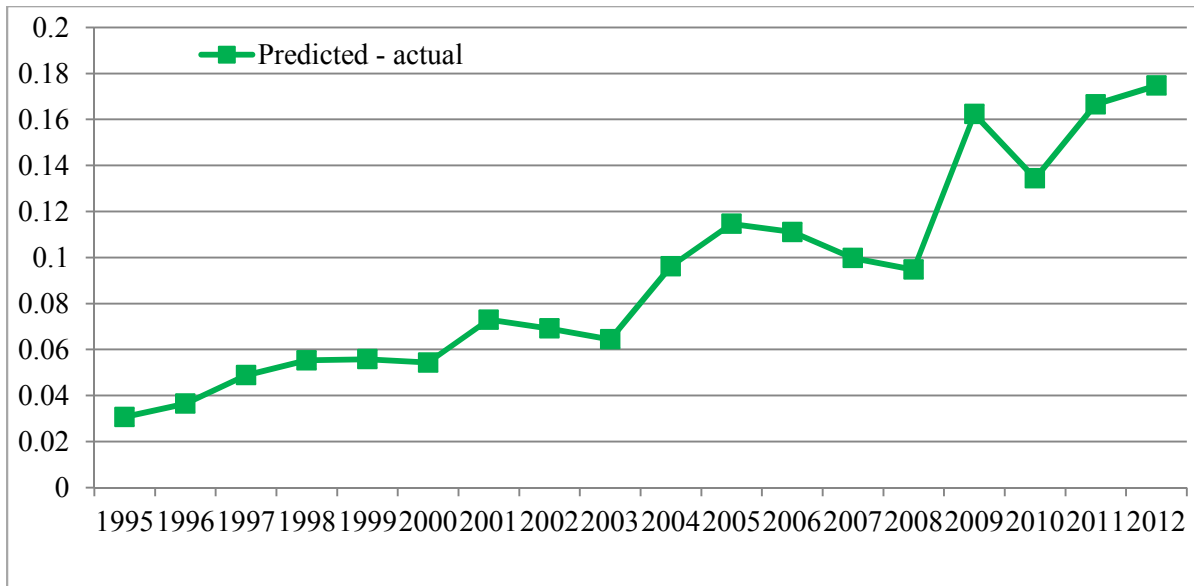
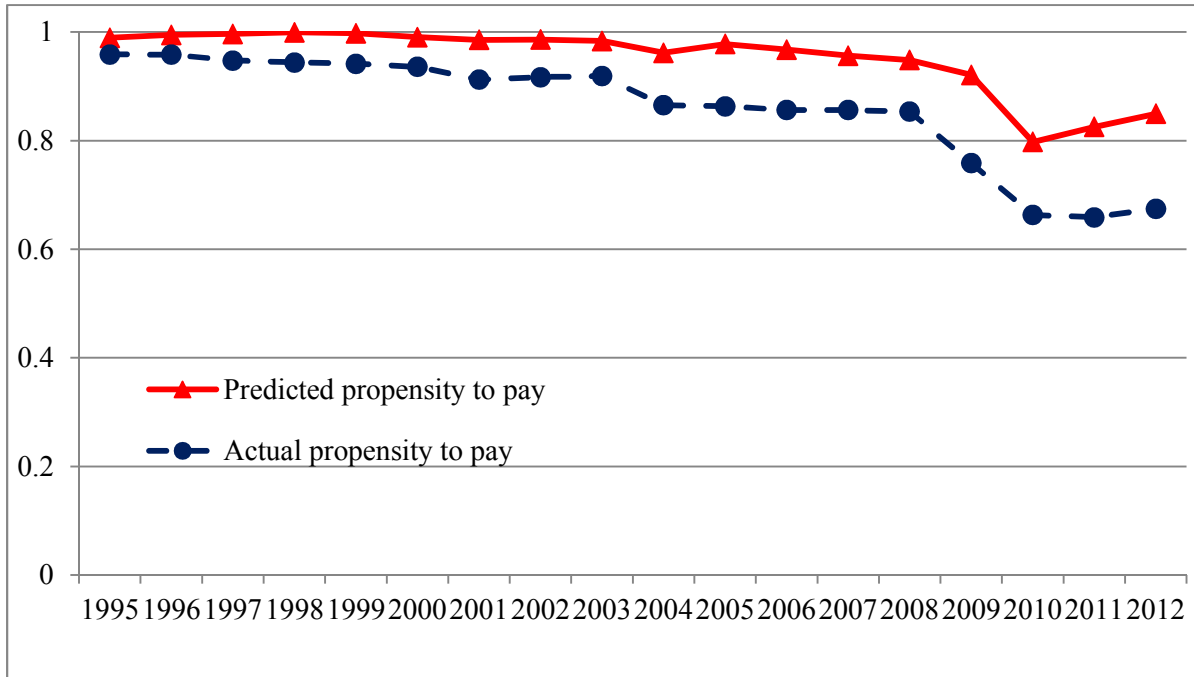


Figure 5, continued

Panel B: Non-TARP bank-years only

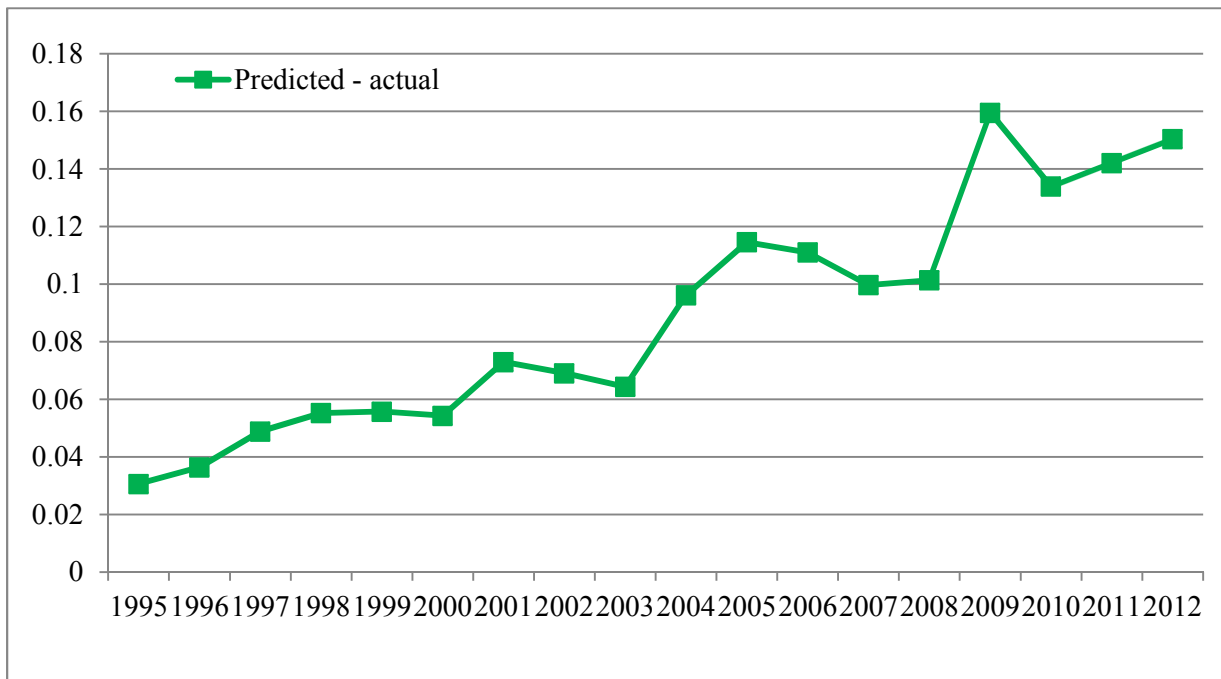
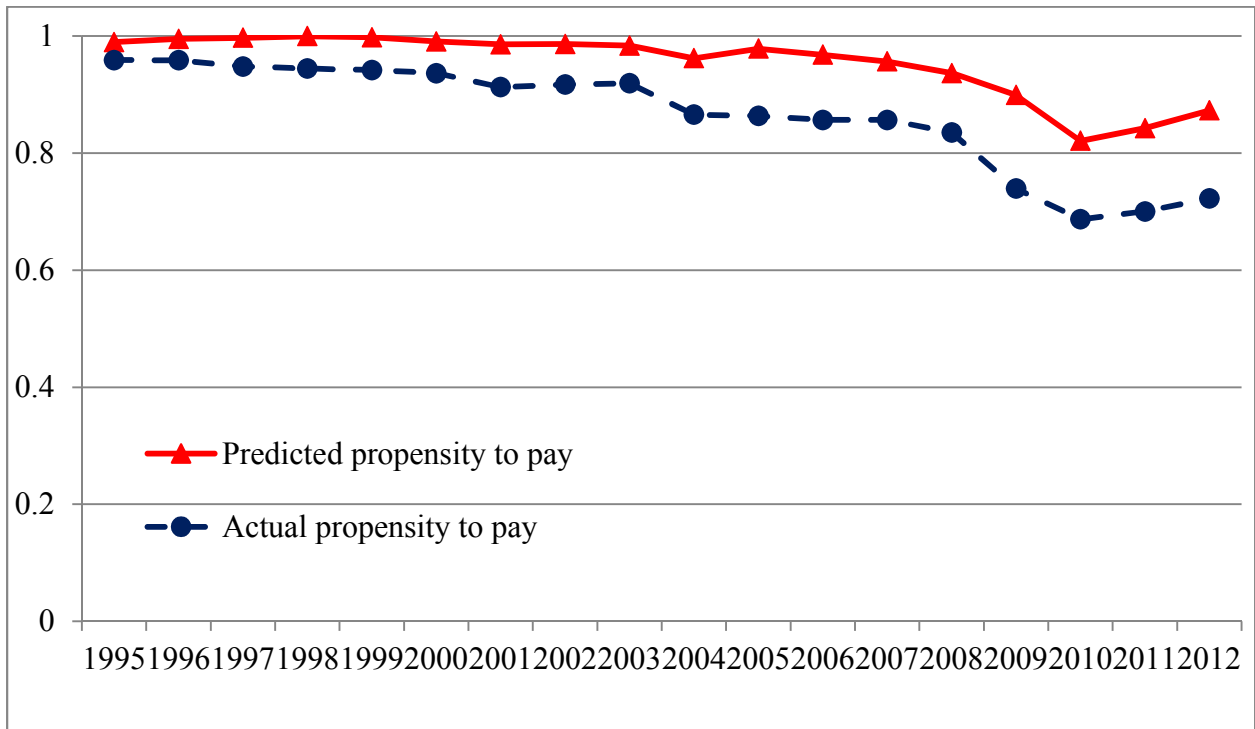
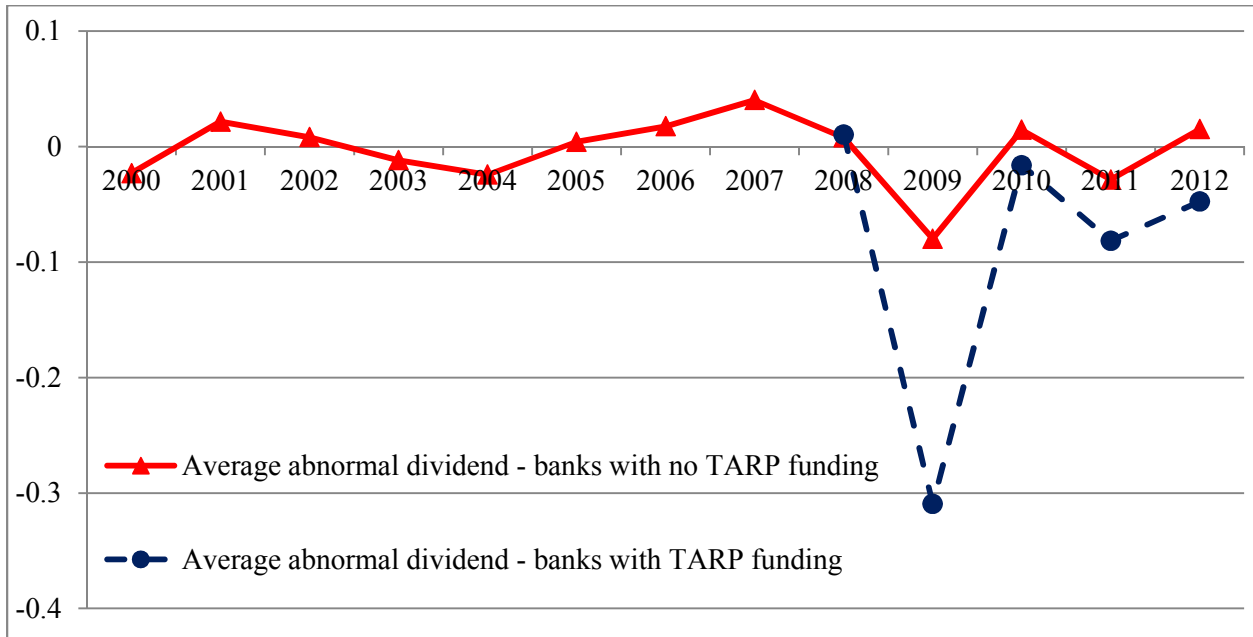


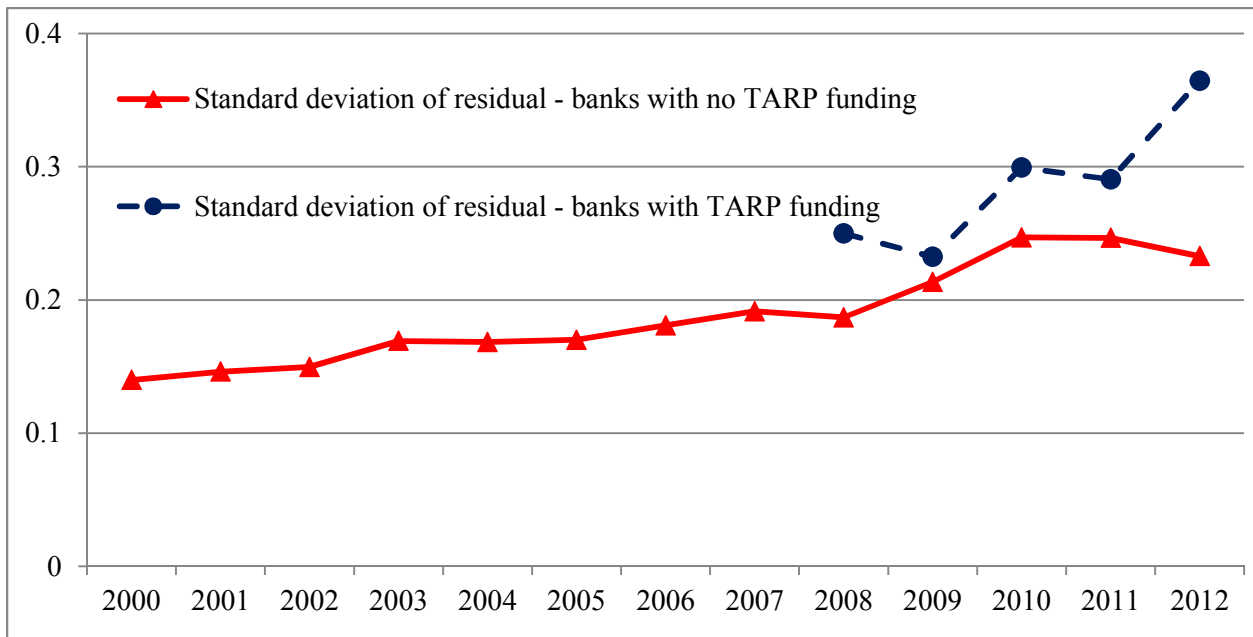
Figure 6: Abnormal dividends and the accuracy of dividend models over time

The graphs show the error term (Panel A) and the squared residual (Panel B) from the panel regression of dividends per share shown in Column 1 of Table 3. The panel regressions are estimated during 1995-2006, hence the residuals in and after 2007 are based on out-of-sample model predictions. The graphs marked with triangles are based on non-TARP bank-years, and the graphs marked with circles are based only on bank-years in which banks had TARP funds outstanding.

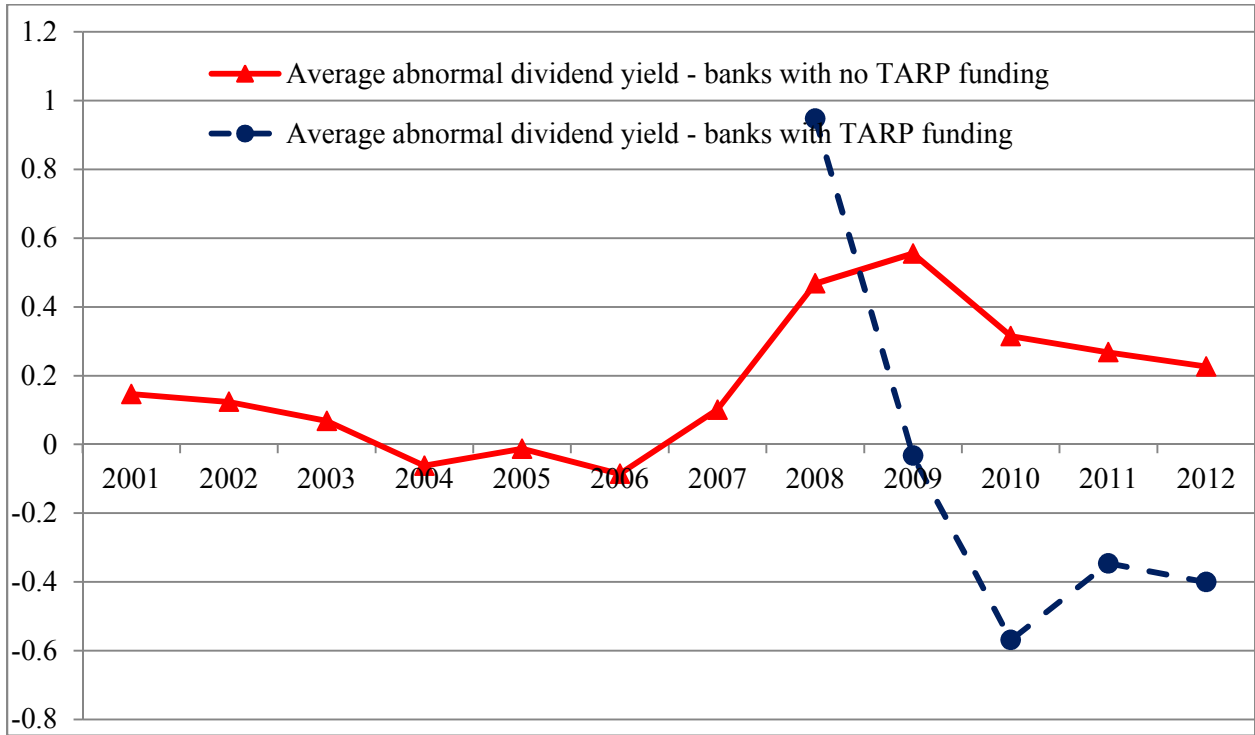
Panel A:



Panel B:



Panel C:



Panel D:

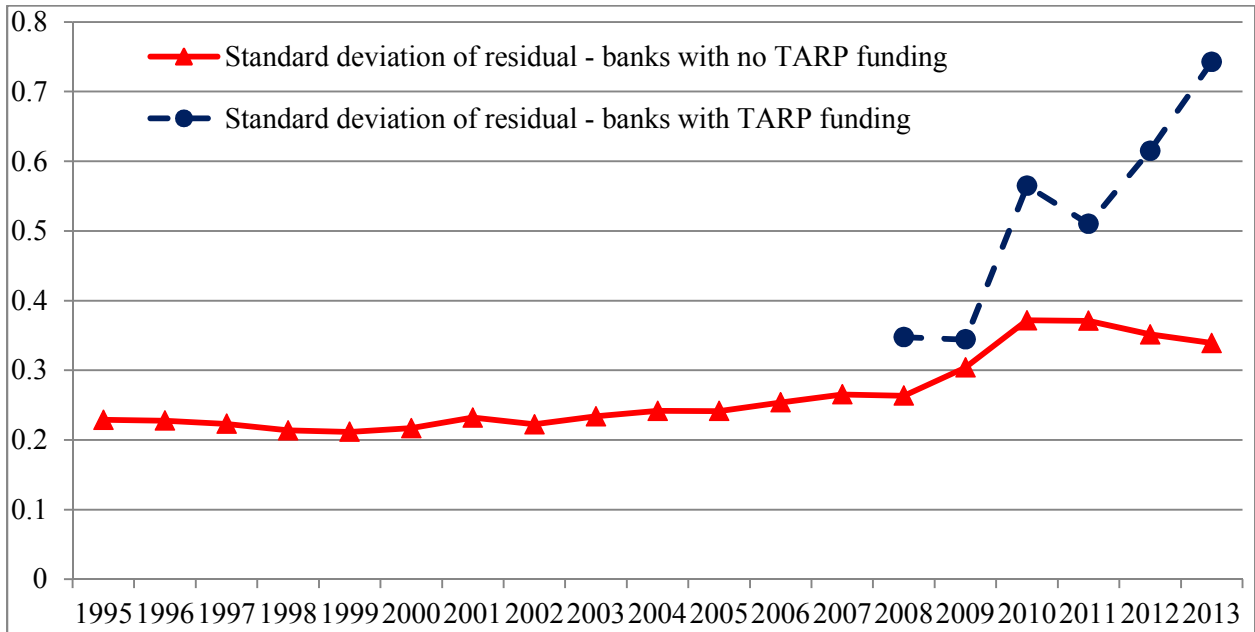
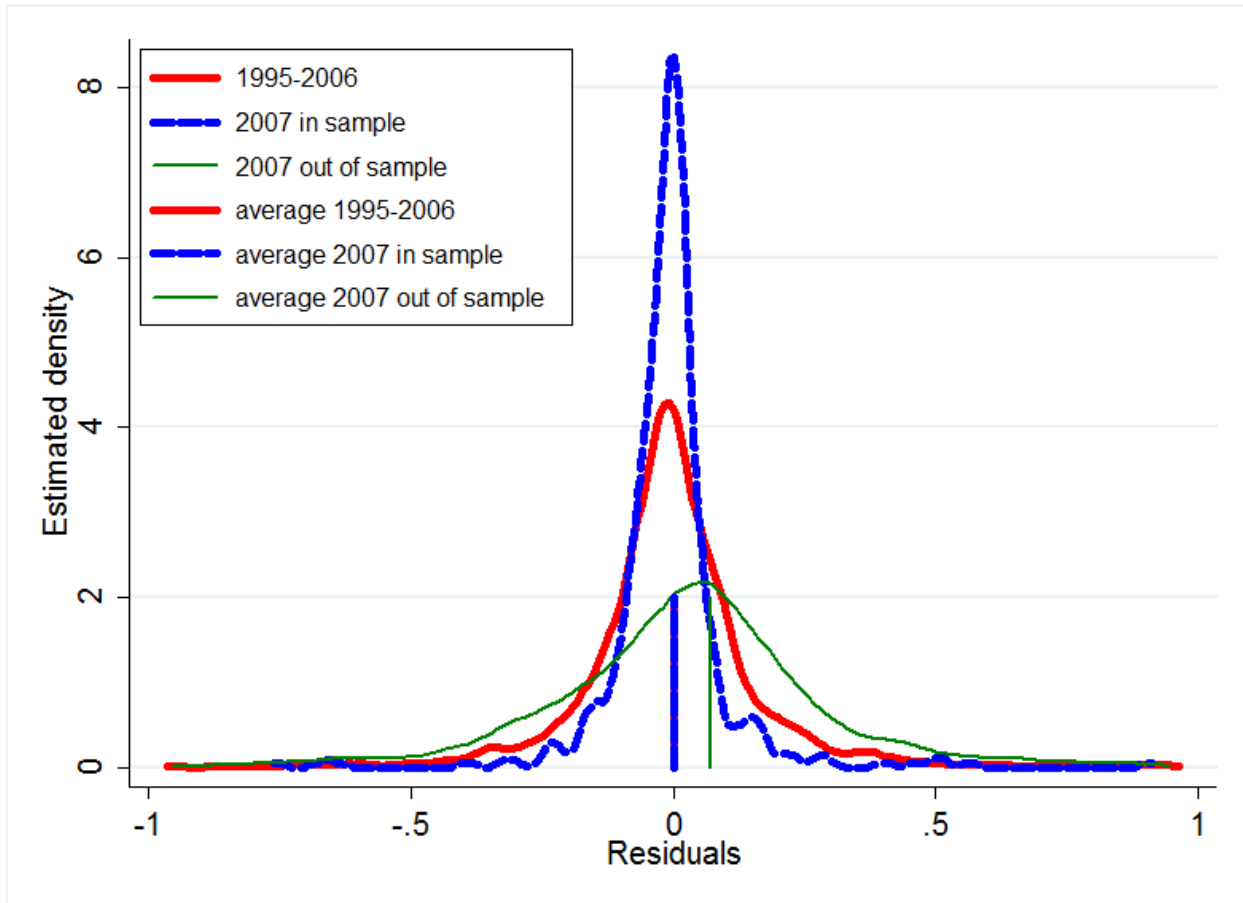


Figure 7: Distribution of abnormal dividends in sample and out of sample

The graphs plot the distribution of abnormal dividends prior to the crisis during 1995-2006 (thick red line), as well as during the crisis estimated out of sample, using the coefficients from 1995-2006 (thin green line), and in sample (dashed blue line). Panel A shows the distribution of residuals for 1995-2006 and the year 2007, and Panel B shows the graphs for 1995-2006 and 2008.

Panel A: Residuals before the crisis and in 2007



Panel B: Residuals before the crisis and in 2008

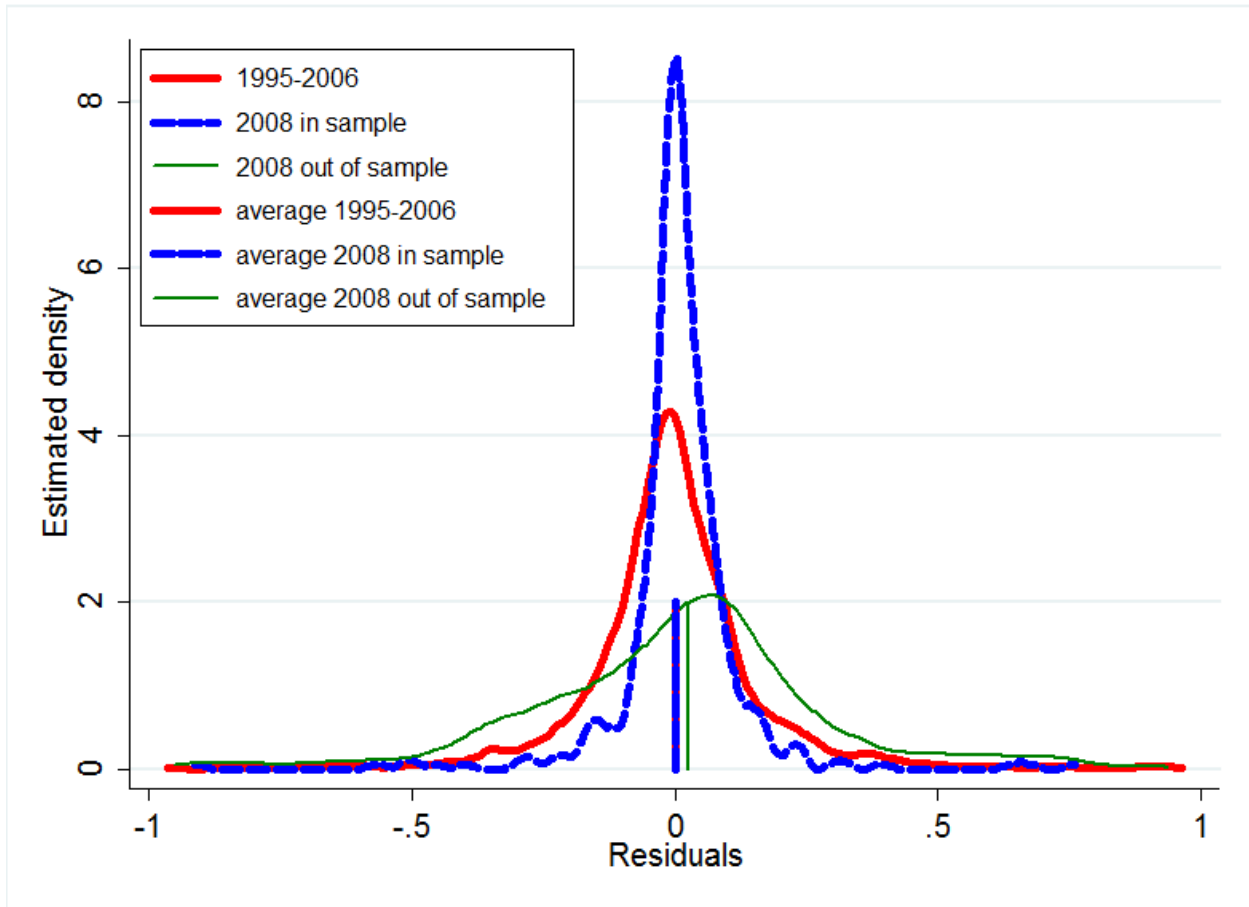
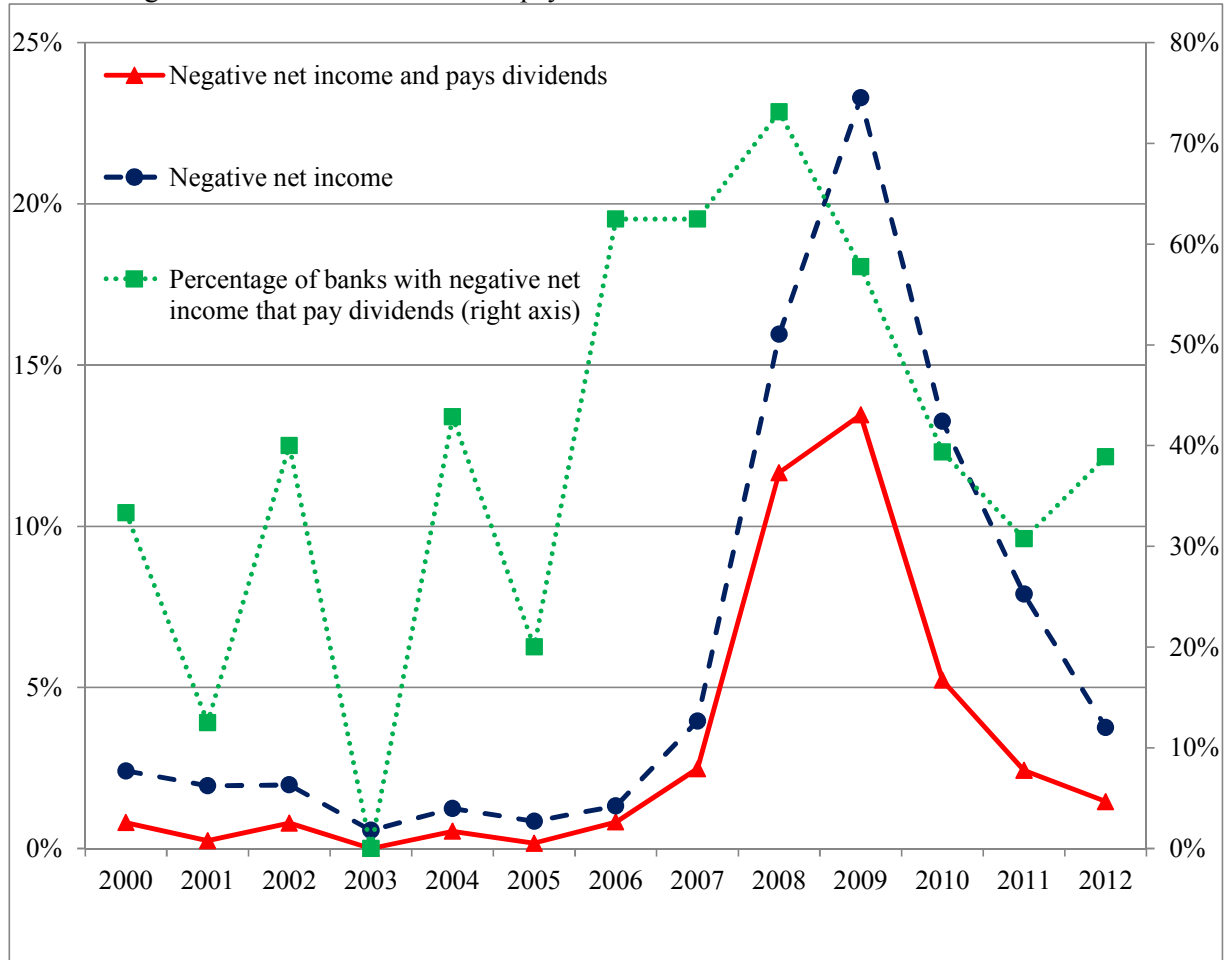


Figure 8: Fraction of banks that pay dividends and have negative earnings

The graphs show the dividend payment behavior (Panel A) and dividend adjustments (Panel B) of banks with negative net income. In Panel A, the graph with triangles shows the percentage of banks (out of all banks in the sample) that have negative net income in a given year and pay dividends. The graph with the circles shows the percentage of banks (out of all banks in the sample) that have negative net income in a given year. Both these series are measured on the left vertical axis. The graph with squares shows the ratio of the first two quantities: the percentage of banks with negative earnings that pay dividends. This series is measured on the right vertical axis. Panel B shows the percentage of banks with negative net income that increased their dividends, decreased them, or kept them constant.

Panel A: Negative net income and dividend payment behavior



Panel B: Negative net income and dividend adjustment behavior

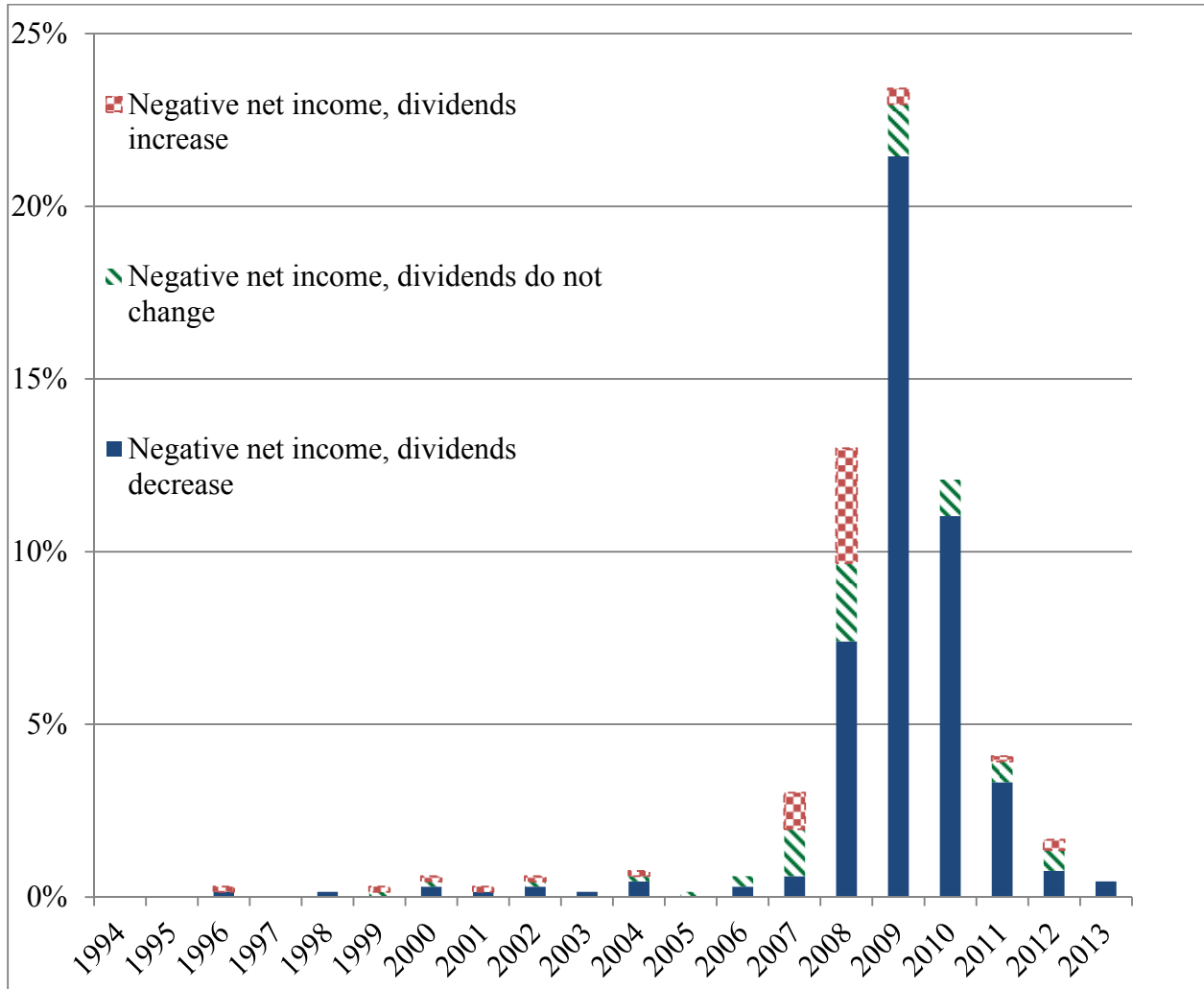
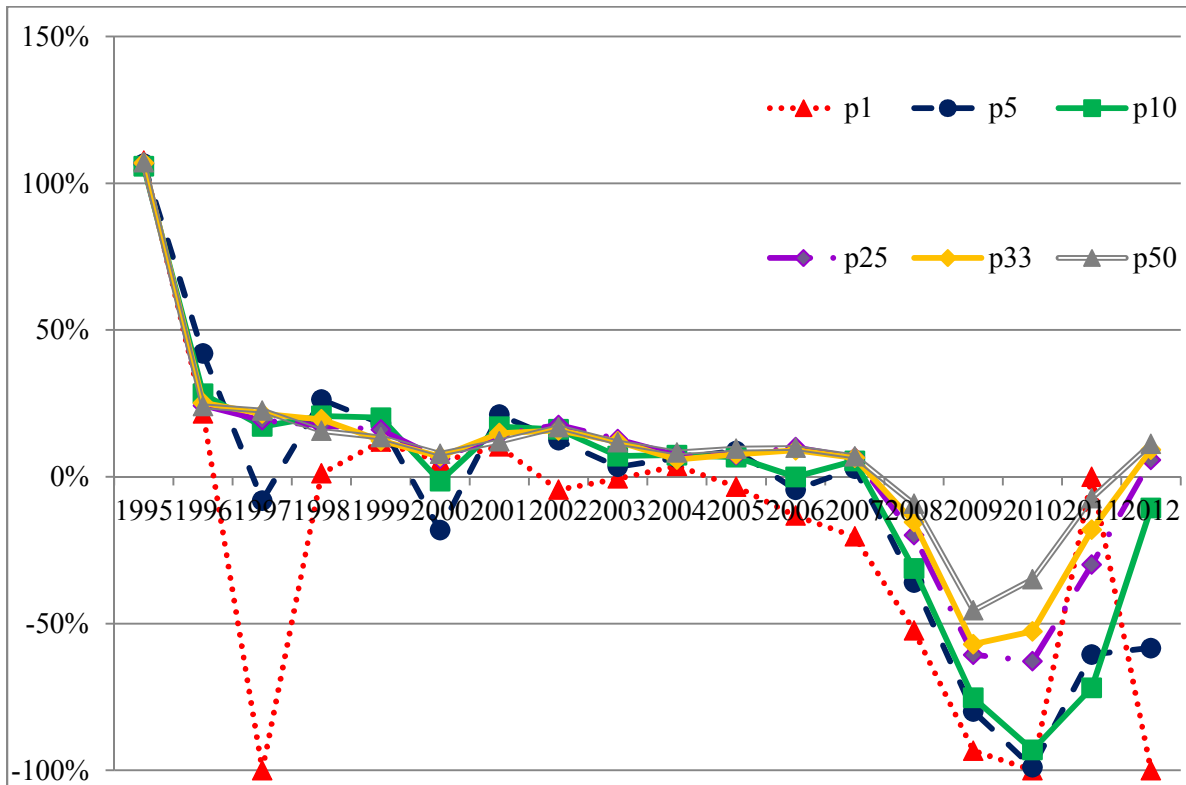


Figure 9: Dividend growth of poorly performing banks over time

The graphs show the year-on-year percentage growth in dividends per share of banks in the lowest 1%, 5%, 10%, 25%, 33%, and 50% of the performance distribution. In Panel A bank performance is measured in stock returns. In Panel B bank performance is measured by net income over total assets (ROA).

Panel A: Year-on-year dividend growth in banks in the lowest quantiles of stock returns



Panel B: Year-on-year dividend growth in banks in the lowest quantiles of net income over total assets (ROA)

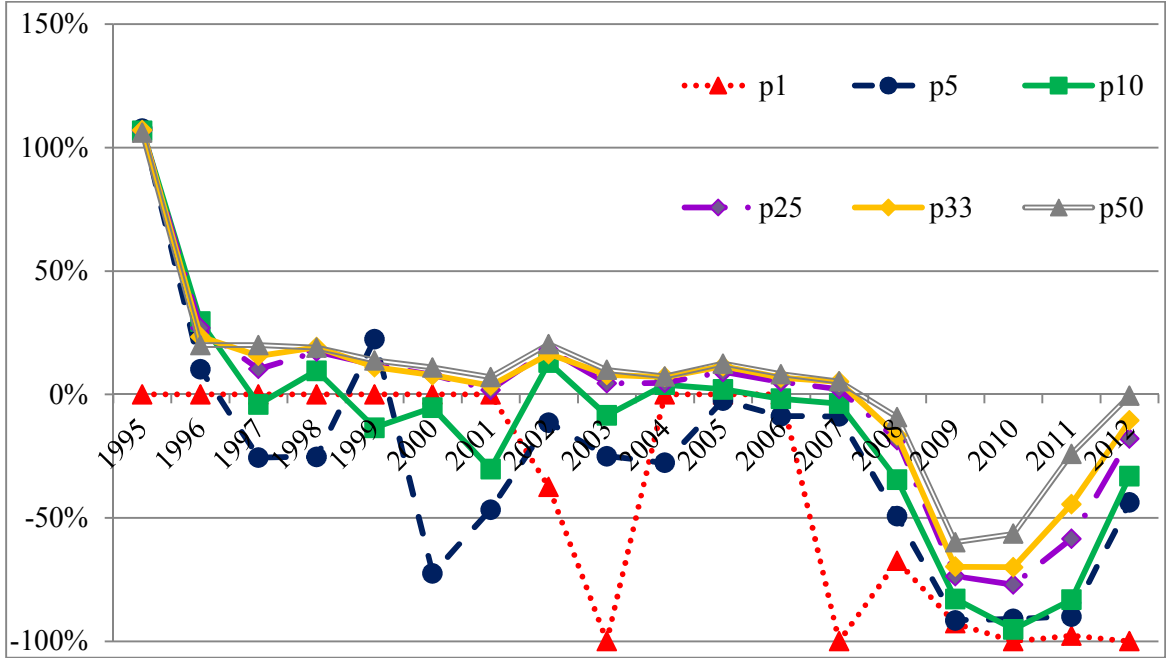


Figure 10: Insider trading and changes in bank dividends

The graphs shows *NPR volume* averaged across banks grouped according to their dividend behavior in each of the years 2000-2012. There are three groups of banks: those with dividend decreases, increases, and no changes in dividends. *NPR volume* is defined as the net purchase ratio calculated based on the number of shares bought and sold.

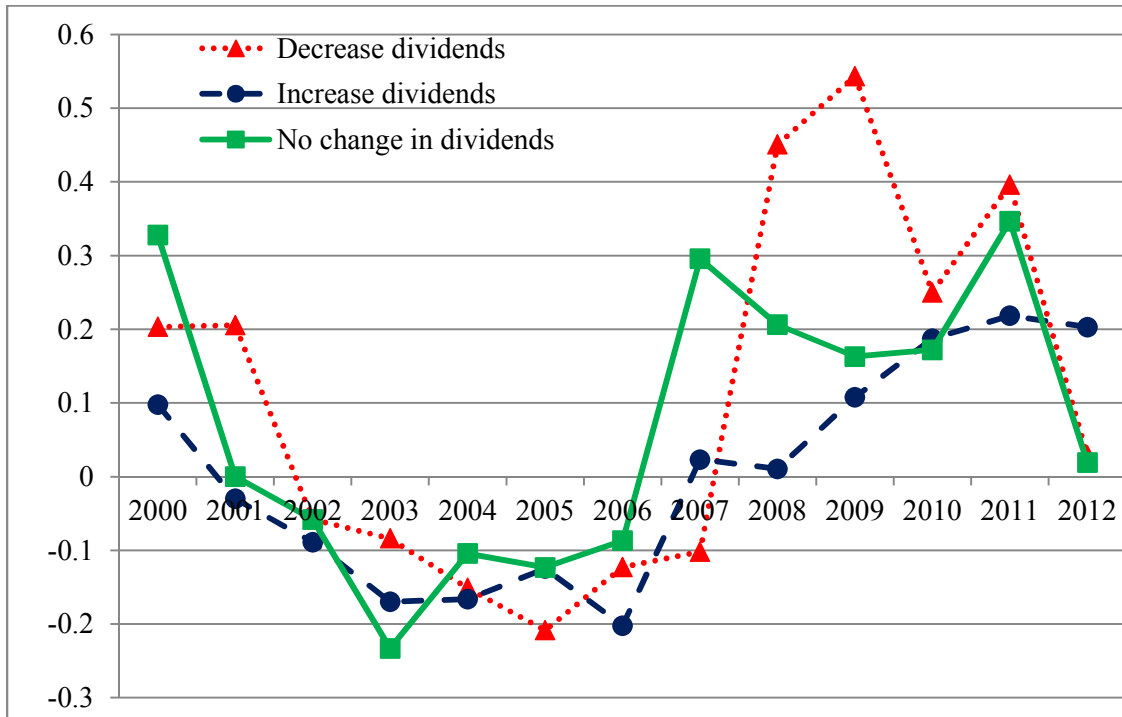


Table 1: Sample descriptives

Information on bank dividends and fundamentals are from SNL Financial. Stock return data are from CRSP. *Panel A* shows the number of banks with non-missing dividend data for each year in our sample. *Panel B* shows descriptive statistics of the variables used in our regressions. The data span 1995-2012 for dividends, and 1994-2012 for the explanatory variables, as some regressions use lagged explanatory variables.

Panel A: Yearly break-down of the number of observations with non-missing dividend data

	Banks with non-missing dividend data	Banks with non-missing dividend data that have no TARP funds outstanding
1995	228	228
1996	258	258
1997	302	302
1998	328	328
1999	342	342
2000	374	374
2001	410	410
2002	506	506
2003	528	528
2004	564	564
2005	591	591
2006	606	606
2007	606	606
2008	583	475
2009	498	361
2010	498	390
2011	494	408
2012	479	428

Panel B: Summary statistics of variables used in the regressions

	Mean	Median	Standard Deviation	Minimum	Maximum	N
Dividend payer dummy	0.567	1	0.496	0	1	13,240
Dividends to book equity	3.19%	3.11%	2.75%	0.00%	31.59%	9,583
Dividend yield	2.00%	2.05%	1.65%	0.00%	6.90%	10,191
Dividend growth	9.27%	0.00%	54.11%	-100.00%	317.39%	12,578
Total assets	12,300	505	113,000	13	2,390,000	10,193
Log total assets	20.37	20.04	1.64	16.35	28.5	10,193
ROA	0.738	0.903	0.876	-5.188	2.329	10,040
Market to book ratio	1.398	1.311	0.741	0.0352	10.76	9,709
Leverage	12.61	8.252	20.56	1.695	524.3	9,168
Retained earnings to total equity	0.569	0.546	8.494	-58.97	789.6	8,790
Deposits to total assets	0.791	0.812	0.095	0.443	0.970	10,188
Risk-weighted capital ratio	15.15%	14.06%	4.58%	8.61%	39.60%	9,711
Interest to noninterest income	8.956	6.635	8.101	0.696	58.32	10,044
Liquidity ratio	0.271	0.259	0.12	0	0.789	10,193
Total asset growth (% year-on-year)	9.57%	6.51%	15.30%	-50.70%	336.90%	9,525
Volatility	0.0267	0.0218	0.0171	0.00355	0.248	4,675
Institutional ownership (%)	21.51%	11.28%	24.56%	0.0005%	100%	6,691

Table 2: Analysis of the decision to pay dividends

Logit regressions of dividend payer (total payout) status on firm fundamentals. The dependent variable in column 1 is a dummy variable equal to 1 if the firm pays dividends. The dependent variable in column 2 is a dummy variable equal to 1 if the pay makes any payout. The model in column 1 (column 2) is estimated during the pre-crisis period 1995-2006 (2000-2006). Independent variables, with the exception of ROA and total asset growth, are lagged by one year. Underneath each coefficient, we show t-statistics that are based on heteroskedasticity-robust standard errors, clustered at the bank level. *, **, and *** indicate that the coefficient is statistically significant at the 10%, 5%, and 1% level.

Dependent variable	Dividend payer	Total payout dummy
	1995-2006	2000-2006
Sample period	(1)	(2)
Retained earnings to total equity	7.3846*** (5.965)	10.6191*** (4.587)
Book equity over total assets	-0.3983*** (-3.597)	-0.3729*** (-3.426)
Lag ROA	5.0281*** (4.712)	4.1657*** (4.546)
Deposits over total assets	8.0262 (1.292)	-1.6401 (-0.302)
Short-term to total assets	-10.8614 (-1.504)	-10.5271 (-1.393)
Log total assets	5.4020*** (3.609)	1.9626*** (3.156)
Risk-weighted capital ratio	0.2921** (2.398)	-0.1843 (-1.588)
Interest to noninterest income	-0.1568*** (-2.656)	-0.1409*** (-2.849)
Liquidity ratio	-4.9032 (-1.304)	-0.0747 (-0.022)
Market to book ratio	-1.1587* (-1.691)	-2.2251*** (-2.978)
ROA	0.9038 (1.295)	1.2819* (1.820)
Total asset growth (% year-on-year)	-1.7469 (-0.985)	-3.8251** (-1.990)
Institutional ownership	-2.0158 (-0.426)	-5.2549 (-1.486)
Fed funds rate	-0.2151 (-1.189)	0.0608 (0.410)
Net interest paid on Fed funds and repos	529.8680** (2.408)	201.9431 (1.017)
Constant	-104.4133*** (-3.378)	-27.4429** (-1.971)
Observations	3,321	2,044
Number of banks	503	442
Pseudo R ²	54%	29%

Table 3: What determines the level of dividends?

Panel regressions of dividend per share on firm fundamentals. Independent variables, with the exception of ROA and total asset growth, are lagged by one year. Columns 1 and 3 show fixed-effects panel regressions and Columns 2 and 4 show random-effects panel regressions. All models are estimated for the pre-crisis period 1995-2006. The dependent variable in columns 1-2 is dividend per share, and the dependent variable in columns 3-4 is dividend yield. Underneath each coefficient we show t-statistics that are based on heteroskedasticity-robust standard errors, clustered at the bank level. *, **, and *** indicate that the coefficient is statistically significant at the 10%, 5%, and 1% level.

Dependent variable	Dividend per share				Dividend yield			
	1995-2006		2007-2008		1995-2006		2007-2008	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Retained earnings to total equity	0.2017 (1.263)	0.2581* (1.830)	-0.0652 (-0.340)	0.5422*** (3.350)	0.2793 (1.430)	0.6735*** (4.284)	-0.7114 (-1.133)	0.8997*** (4.267)
Book equity over total assets	-0.0297* (-1.849)	-0.0304** (-2.013)	-0.0115 (-1.133)	0.0003 (0.016)	-0.0221 (-0.836)	-0.0232 (-1.148)	-0.0256 (-0.662)	0.0050 (0.149)
Lag ROA	0.2448** (2.575)	0.2405*** (2.676)	0.2408 (1.581)	0.2320* (1.885)	0.2056* (1.673)	0.2860*** (2.943)	0.4575** (2.119)	0.3788*** (2.848)
Deposits over total assets	-0.3566 (-0.737)	-0.5301 (-1.230)	-1.0285 (-1.232)	0.2194 (0.376)	-2.3076*** (-3.030)	-2.2732*** (-3.554)	0.7992 (0.301)	-1.8796 (-1.623)
Short-term to total assets	-0.4122 (-1.076)	-0.6224 (-1.614)	1.0565 (0.956)	0.5253 (0.286)	0.8712 (1.571)	0.4970 (0.918)	1.5096 (0.291)	-0.9733 (-0.539)
Log total assets	0.3964*** (5.192)	0.2863*** (5.164)	0.4773* (1.774)	0.2322*** (2.886)	0.2551*** (2.888)	0.0907** (2.090)	0.9175 (1.345)	0.2098*** (2.681)
Risk-weighted capital ratio	-0.0092 (-1.430)	-0.0088 (-1.468)	-0.0044 (-0.359)	0.0205* (1.759)	-0.0173 (-1.446)	-0.0136 (-1.334)	0.0189 (0.647)	-0.0072 (-0.382)
Interest to noninterest income	0.0008 (0.196)	0.0018 (0.490)	0.0094** (2.174)	0.0087 (1.488)	-0.0002 (-0.026)	-0.0069 (-1.028)	0.0249 (1.604)	-0.0327*** (-4.825)
Liquidity ratio	0.1319 (0.717)	0.1313 (0.747)	0.1564 (0.217)	0.3366 (0.577)	0.7690** (2.187)	0.7028** (2.302)	6.2686 (1.159)	1.0487 (1.193)
Market to book ratio	-0.0602 (-1.209)	-0.0575 (-1.213)	0.0647 (0.398)	-0.0699 (-0.642)				
ROA	0.0048 (0.157)	-0.0125 (-0.404)	0.1135*** (2.836)	0.0970*** (3.023)	-0.2731*** (-4.425)	-0.2617*** (-4.195)	-0.0886 (-0.894)	-0.0424 (-0.505)
Total asset growth (% year-on-year)	0.1149 (1.174)	0.0122 (0.133)	0.0103 (0.101)	-0.1058 (-0.630)	-0.2398 (-1.441)	-0.6496*** (-4.262)	0.1818 (0.393)	-0.6218 (-1.396)
Institutional ownership	0.1376 (0.711)	0.1781 (0.960)	-0.4921 (-0.775)	-0.7437 (-1.279)	0.1300 (0.674)	0.0805 (0.419)	-1.4586 (-1.100)	-0.9316* (-1.754)
Fed funds rate	-0.0146 (-1.587)	-0.0249*** (-3.184)	-0.1939 (-0.850)	-0.1781 (-0.932)	0.0716*** (4.334)	0.0687*** (4.934)	-2.8411*** (-4.554)	-2.6364*** (-9.577)
Net interest paid on Fed funds and repos	1.4372 (0.119)	2.3071 (0.194)	28.0554 (0.840)	36.0467 (0.928)	-27.5541** (-2.326)	-22.2629* (-1.897)	37.0091 (0.387)	74.8591*** (3.089)
Constant	-7.0861*** (-3.658)	-4.4442*** (-3.156)	-7.3786 (-1.362)	-3.8771** (-2.059)	-1.2605 (-0.532)	1.7682 (1.368)	-4.2720 (-0.277)	12.5676*** (4.820)
Bank FE	Yes	No	Yes	No	Yes	No	Yes	No
Observations	3,321	3,321	966	966	3,321	3,321	966	966
Number of banks	503	503	503	503	503	503	503	503
R ²	22%	5%	9%	7%	5%	9%	19%	22%

Table 4: Dividend growth and future performance

OLS regressions of future stock returns and future operating performance on dividend growth. The dependent variable in columns 1 and 2 (columns 3 and 4) is the stock return (ROA) in year $t+1$. The independent variables include dividend growth in year t , period dummies, and control variables. Control variables are lagged one year with respect to dividend growth, i.e. are measured in year $t-1$. The regressions are estimated for the period 1995-2012. *Crisis* is a dummy variable for the period 2007-2008. *Postcrisis* is a dummy variable for the period 2009-2012.

	Future returns		Future ROA	
	(1)	(2)	(3)	(4)
Dividend growth	0.0662** (2.559)	0.0475** (1.983)	0.1961*** (5.839)	0.1107*** (3.975)
Dividend growth \times crisis	0.0063 (0.139)	0.0192 (0.418)	0.7608*** (4.941)	0.6065*** (4.478)
Dividend growth \times postcrisis	-0.0294 (-0.752)	-0.0221 (-0.555)	0.5067*** (7.561)	0.1751*** (3.305)
Crisis	-0.2659*** (-19.698)	-0.2880*** (-19.175)	-0.8570*** (-19.760)	-0.7517*** (-18.669)
Postcrisis	-0.0087 (-0.860)	-0.0051 (-0.371)	-0.3811*** (-14.951)	-0.0942*** (-3.150)
Retained earnings to total equity		0.0109 (0.667)		0.1042*** (2.784)
Book equity over total assets		0.0027* (1.797)		0.0076** (2.129)
ROA		0.0454*** (2.741)		0.4453*** (13.739)
Deposits over total assets		0.1177* (1.683)		0.3785* (1.893)
Short-term to total assets		0.3213*** (3.398)		0.0419 (0.198)
Log total assets		0.0030 (0.660)		0.0317*** (2.778)
Risk-weighted capital ratio		-0.0052*** (-3.583)		0.0165*** (5.659)
Interest to noninterest income		-0.0012 (-1.464)		-0.0056*** (-2.590)
Liquidity ratio		0.1700*** (3.723)		0.2377** (2.325)
Market to book ratio		-0.0908*** (-9.851)		0.1056*** (4.915)
Total asset growth (% year-on-year)		0.0379 (0.828)		-0.2466 (-1.616)
Institutional ownership		0.0095 (0.266)		-0.0819 (-0.938)
Fed fund rate		0.0187*** (7.461)		0.0062 (1.233)
Net interest paid on Fed funds and repos		-5.3214** (-2.275)		-4.1836 (-0.915)
Constant	0.0777*** (13.052)	-0.0362 (-0.282)	1.1025*** (57.928)	-0.9317*** (-2.868)
Observations	4,756	4,756	5,162	5,162
Adjusted R ²	9.70%	13.30%	29.80%	42.70%

Table 5: Dividend growth and future performance – year-by-year analysis during the crisis

OLS regressions of future stock returns and future operating performance on dividend growth. The dependent variable in columns 1-3 and 7-9 (columns 4-6 and 10-12) is the stock return (ROA) in year t+1. Panel A uses a continuous measure of dividend growth. Panel B includes two dummy variables, one for an increase in dividends, and one for a decrease in dividends. The independent variables in columns 1, 4, 7, and 10 are measured in 2006; those in columns 2, 5, 8, and 11 are measured in 2007; and those in 2008 columns 3, 6, 9, and 12 are measured in 2008. Independent variables, with the exception of ROA, stock return and total asset growth, are lagged by one year. Underneath each coefficient we show t-statistics that are based on heteroskedasticity-robust standard errors, clustered at the bank. *, **, and *** indicate that the coefficient is statistically significant at the 10%, 5% and 1% level.

Panel A: Dividend growth and future performance

Covariates measured in	Future returns			Future ROA			Future returns			Future ROA		
	2006 (1)	2007 (2)	2008 (3)	2006 (4)	2007 (5)	2008 (6)	2006 (7)	2007 (8)	2008 (9)	2006 (10)	2007 (11)	2008 (12)
Dividend growth	-0.0776* (-1.879)	-0.0273 (-0.568)	0.2510*** (4.318)	0.1002 (1.269)	0.2696 (1.563)	1.9264*** (6.172)	-0.0418 (-1.370)	-0.0296 (-0.601)	0.1473** (2.460)	-0.0140 (-0.260)	0.2564 (1.304)	1.3707*** (4.877)
Retained earnings to total equity							0.0995*** (3.433)	0.0289 (0.551)	0.0236 (0.363)	0.1665*** (2.397)	0.8851*** (3.587)	0.4409** (2.105)
Book equity over total assets							0.0114** (2.285)	0.0049 (0.425)	0.0464 (1.530)	0.0076 (0.156)	0.0317 (0.715)	0.0751** (2.418)
ROA							0.0171 (0.523)	0.1034*** (2.110)	0.1763*** (3.560)	0.6132*** (6.327)	0.5467** (2.218)	0.8564*** (5.065)
Deposits over total assets							0.0927 (0.665)	0.2314 (1.057)	-0.1086 (-0.327)	0.5758 (1.359)	0.7516 (0.779)	-0.5280 (-0.688)
Short-term to total assets							0.3171 (1.135)	1.2606*** (2.981)	-0.2660 (-0.392)	0.9095 (1.309)	2.0927 (1.413)	-1.2615 (-0.817)
Log total assets							-0.0124 (-1.293)	0.0138 (0.846)	-0.0077 (-0.386)	0.0088 (0.514)	-0.0009 (-0.007)	-0.0272 (-0.390)
Risk-weighted capital ratio							0.0078** (2.570)	0.0018 (0.362)	0.0058 (0.903)	0.0124* (1.763)	-0.0164 (-0.599)	0.0175 (0.668)
Interest to noninterest income							-0.0045*** (-2.713)	-0.0012 (-0.425)	-0.0047* (-1.667)	-0.0050 (-1.626)	-0.0334 (-1.602)	-0.0202*** (-2.664)
Liquidity ratio							0.1101 (1.066)	0.3599** (2.235)	0.3458* (1.797)	-0.0634 (-0.337)	1.8941*** (2.692)	1.6087** (2.370)
Market to book ratio							-0.0117 (-0.583)	0.0097 (0.289)	0.0240 (0.428)	0.0622 (1.361)	0.2474 (1.034)	0.3692** (2.045)
Total asset growth (% year-on-year)							-0.1064 (-1.190)	-0.3654** (-2.321)	-0.2223 (-1.612)	-0.1233 (-0.653)	0.8252 (0.904)	-1.6828* (-1.684)
Institutional ownership							-0.1056 (-1.575)	-0.0694 (-0.708)	0.0001 (0.001)	0.0549 (0.442)	-1.9643* (-1.706)	-0.9267 (-1.638)
Net interest paid on Fed funds and repos							-7.8197 (-1.044)	-19.7459*** (-3.436)	0.1187 (0.014)	-35.7593* (-1.957)	9.6953 (0.359)	13.0733 (0.632)
Constant	-0.1434*** (-14.879)	0.2212*** (-14.727)	-0.1440*** (-6.942)	0.9254*** (38.766)	0.2963*** (4.052)	0.0387 (0.591)						
Observations	413	414	409	412	414	410						
Adjusted R ²	0.80%	0.00%	1.90%	0.00%	0.00%	11.00%		6.80%	6.60%	32.00%	15.00%	25.70%

Panel B: Dividend increases, dividend decreases, and future performance

Covariates measured in	Future returns			Future ROA			Future returns			Future ROA		
	2006 (1)	2007 (2)	2008 (3)	2006 (4)	2007 (5)	2008 (6)	2006 (7)	2007 (8)	2008 (9)	2006 (10)	2007 (11)	2008 (12)
Dividend decrease	0.1568*** (4.137)	-0.0444 (-0.706)	-0.1869** (-2.176)	0.2803*** (3.203)	0.0467 (0.145)	-1.0868*** (-4.814)	0.1180*** (2.965)	-0.0649 (-0.994)	-0.1123 (-1.595)	0.2274*** (3.289)	-0.3138 (-0.943)	-0.9029*** (-4.387)
Dividend increase	0.0396 (1.490)	0.0603* (1.664)	-0.0485 (-0.603)	0.2921*** (4.063)	0.2630 (1.512)	0.1901 (1.563)	0.0691*** (2.656)	0.0564 (1.563)	-0.0422 (-0.663)	0.1267** (2.205)	0.0624 (0.341)	0.0110 (0.093)
Retained earnings to total equity							0.1001*** (3.505)	0.0320 (0.616)	0.0258 (0.395)	0.1612** (2.332)	0.8688*** (3.560)	0.4390** (2.025)
Book equity over total assets							0.0120*** (2.723)	0.0055 (0.487)	0.0453 (1.574)	0.0091 (1.323)	0.0340 (0.770)	0.0736** (2.318)
ROA							0.0039 (0.122)	0.0800 (1.623)	0.1840*** (3.610)	0.5948*** (6.141)	0.5620** (2.400)	0.8352*** (5.112)
Deposits over total assets							0.0892 (0.657)	0.2026 (0.922)	-0.1158 (-0.350)	0.5912 (1.409)	0.7213 (0.736)	-0.5162 (-0.667)
Short-term to total assets							0.4045 (1.458)	1.2696*** (2.951)	-0.2920 (-0.423)	1.0841 (1.594)	2.0213 (1.327)	-1.6096 (-1.022)
Log total assets							-0.0103 (-1.076)	0.0102 (0.623)	-0.0019 (-0.093)	0.0136 (0.802)	-0.0106 (-0.083)	0.0138 (0.210)
Risk-weighted capital ratio							0.0077** (2.473)	0.0030 (0.596)	0.0071 (1.162)	0.0120* (1.726)	-0.0155 (-0.563)	0.0333 (1.395)
Interest to noninterest income							-0.0042** (-2.388)	-0.0013 (-0.442)	-0.0050* (-1.669)	-0.0041 (-1.342)	-0.0332 (-1.576)	-0.0201** (-2.530)
Liquidity ratio							0.1139 (1.104)	0.3674** (2.291)	0.3478* (1.802)	-0.0516 (-0.273)	1.9346*** (2.758)	1.4251** (2.167)
Market to book ratio							-0.0104 (-0.517)	0.0101 (0.304)	0.0204 (0.369)	0.0653 (1.410)	0.2441 (1.021)	0.3651** (2.042)
Total asset growth (% year-on-year)							-0.0948 (-1.060)	-0.3648** (-2.332)	-0.2079 (-1.448)	-0.0951 (-0.516)	0.8353 (0.911)	-1.6423 (-1.566)
Institutional ownership							-0.1032 (-1.592)	-0.0562 (-0.576)	-0.0249 (-0.224)	0.0590 (0.480)	-1.9635* (-1.687)	-1.0344* (-1.943)
Net interest paid on Fed funds and repos							-9.9199 (-1.253)	-20.2672*** (-3.458)	-0.0170 (-0.002)	-40.4589** (-2.137)	9.8827 (0.358)	17.3571 (0.833)
Constant	-0.1965*** (-7.955)	-0.2676*** (-8.228)	-0.0777 (-0.994)	0.6778*** (10.039)	0.1184 (0.760)	0.1451 (1.553)	-0.3074 (-1.127)	-0.9249** (-2.014)	-0.6263 (-0.768)	-1.0287* (-1.840)	-1.7481 (-0.500)	-2.1151 (-1.162)
Observations	413	414	409	412	414	410	413	414	409	412	414	410
Adjusted R ²	4%	1%	2%	4%	0%	12%	22%	8%	7%	33%	15%	27%

Table 6: Dividend growth and crisis performance - robustness

OLS regressions of crisis performance on dividend growth and firm characteristics. The dependent variable in columns 1-2 and 5-6 is cumulative returns during July 2007 – December 2008. The dependent variable in columns 3-4 and 7-8 is cumulative net income scaled by total assets during July 2007 – December 2009. The independent variables in columns 1, 3, 5, and 7 are measured in 2007 and those in columns 2, 4, 6, and 8 are measured in 2008. Independent variables, with the exception of ROA, stock return and total asset growth, are lagged by one year. Underneath each coefficient we show t-statistics that are based on heteroskedasticity-robust standard errors, clustered at the bank. *, **, and *** indicate that the coefficient is statistically significant at the 10%, 5% and 1% level.

Dependent variables	Cumulative returns July 2007 - December 2008		Cumulative net income July 2007 - December 2009		Cumulative returns July 2007 - December 2008		Cumulative net income July 2007 - December 2009	
	2007 (1)	2008 (2)	2007 (3)	2008 (4)	2007 (5)	2008 (6)	2007 (7)	2008 (8)
Covariates measured in								
Dividend growth	0.0242 (0.391)	0.3753*** (5.257)	0.0042 (1.099)	0.0399*** (5.876)	-0.0060 (-0.115)	0.1069* (1.826)	0.0004 (0.109)	0.0258*** (4.832)
Retained earnings to total equity					0.0278 (0.575)	-0.0448 (-1.078)	0.0151*** (3.586)	0.0120*** (3.636)
Book equity over total assets					0.0081 (0.770)	0.0194** (2.009)	-0.0001 (-0.142)	0.0006 (1.099)
Deposits over total assets					0.1349 (0.745)	0.2331 (1.334)	0.0071 (0.442)	0.0099 (0.773)
Short-term to total assets					0.6573* (1.720)	0.2024 (0.603)	0.0342 (1.305)	0.0009 (0.035)
Log total assets					-0.0019 (-0.129)	-0.0015 (-0.119)	-0.0001 (-0.064)	-0.0007 (-0.551)
Risk-weighted capital ratio					0.0038 (0.778)	0.0127** (2.408)	-0.0000 (-0.096)	0.0001 (0.305)
Interest to noninterest income					-0.0034 (-1.445)	-0.0031 (-1.621)	-0.0004 (-1.609)	-0.0005** (-2.339)
Liquidity ratio					0.3215*** (2.180)	0.0960 (0.660)	0.0285** (2.272)	0.0107 (0.983)
Market to book ratio					0.0009 (0.026)	0.0652 (1.535)	0.0047 (1.521)	0.0132*** (5.247)
Total asset growth (% year-on-year)					-0.1860 (-1.376)	0.0092 (0.086)	-0.0192 (-0.980)	-0.0212 (-1.255)
Institutional ownership					-0.1399 (-1.633)	0.0072 (0.098)	-0.0211* (-1.797)	-0.0194* (-1.949)
Fed funds balance × rate					-11.8364** (-2.339)	-3.2286 (-0.878)	-0.1409 (-0.327)	0.5024 (1.176)
Stock return							0.0285*** (2.773)	0.0320*** (9.439)
ROA					0.3079*** (7.947)	0.1706*** (9.122)		
Lag ROA					-0.1322** (-2.310)	0.0403 (0.944)	0.0093** (2.447)	
Constant	-0.3224*** (-21.708)	-0.3169*** (-23.546)	0.0072*** (5.473)	0.0077*** (6.723)	-0.6965* (-1.745)	-0.9841** (-2.552)	-0.0197 (-0.521)	-0.0065 (-0.180)
Observations	414	409	414	410	414	409	414	410
Adjusted R ²	0%	10%	0%	15%	21%	35%	20%	43%

Table 7: Total payout growth and future performance

OLS regressions of future stock returns and future operating performance on total payout growth. The dependent variable in columns 1 and 2 (columns 3 and 4) is the stock return (ROA) in year t+1. The independent variables include total payout growth in year t, period dummies, and control variables. Control variables are lagged one year with respect to the total payout growth, i.e. are measured in year t-1. The regressions are estimated for the period 2000-2012. *Crisis* is a dummy variable for the period 2007-2008. *Postcrisis* is a dummy variable for the period 2009-2012.

	Future returns		Future ROA	
	(1)	(2)	(3)	(4)
Total payout growth	0.0271 (0.795)	0.0414 (1.276)	0.2106*** (3.261)	0.1059** (2.060)
Total payout growth × crisis	0.0454 (0.873)	0.0244 (0.467)	0.7463*** (4.511)	0.6217*** (4.311)
Total payout growth × postcrisis	0.0096 (0.208)	-0.0214 (-0.460)	0.4922*** (5.547)	0.2060*** (2.974)
Crisis	-0.2535*** (-18.524)	-0.2702*** (-17.312)	-0.8247*** (-19.077)	-0.7322*** (-17.915)
Postcrisis	0.0037 (0.347)	-0.0053 (-0.359)	-0.3487*** (-13.324)	-0.0976*** (-2.984)
Retained earnings to total equity		0.0024 (0.154)		0.1162*** (2.760)
Book equity over total assets		0.0021 (1.421)		0.0076** (2.079)
ROA		0.0460*** (2.610)		0.4028*** (11.579)
Deposits over total assets		0.0914 (1.162)		0.3069 (1.360)
Short-term to total assets		0.4022*** (3.997)		0.1259 (0.501)
Log total assets		-0.0020 (-0.364)		0.0291** (2.005)
Risk-weighted capital ratio		-0.0038** (-2.581)		0.0169*** (4.680)
Interest to noninterest income		-0.0006 (-0.694)		-0.0074*** (-2.926)
Liquidity ratio		0.1349*** (2.956)		0.2653** (2.316)
Market to book ratio		-0.0827*** (-8.490)		0.1296*** (5.050)
Total asset growth (% year-on-year)		0.0161 (0.276)		-0.1781 (-0.686)
Institutional ownership		0.0246 (0.574)		-0.1025 (-0.946)
Fed fund rate		0.0131*** (4.206)		0.0010 (0.160)
Net interest paid on Fed funds and repos		-8.7868*** (-3.139)		-7.6193 (-1.316)
Constant	0.0653*** (10.219)	0.0770 (0.519)	1.0701*** (52.666)	-0.8254** (-2.111)
Observations	3,927	3,927	4,199	4,199
Adjusted R ²	10%	13%	27%	39%

Table 8: Total payout growth and future performance – year-by-year analysis during the crisis

OLS regressions of future stock returns and future operating performance on total payout growth. The dependent variable in columns 1-3 and 7-9 (columns 4-6 and 10-12) is the stock return (ROA) in year $t+1$. The independent variables in columns 1, 4, 7, and 10 are measured in 2006; those in columns 2, 5, 8, and 11 are measured in 2007; and those in 2008 columns 3, 6, 9, and 12 are measured in 2008. Independent variables, with the exception of ROA, stock return and total asset growth, are lagged by one year. Underneath each coefficient we show t -statistics that are based on heteroskedasticity-robust standard errors, clustered at the bank. *, **, and *** indicate that the coefficient is statistically significant at the 10%, 5% and 1% level.

Covariates measured in	Future returns			Future ROA			Future returns			Future ROA		
	2006 (1)	2007 (2)	2008 (3)	2006 (4)	2007 (5)	2008 (6)	2006 (7)	2007 (8)	2008 (9)	2006 (10)	2007 (11)	2008 (12)
Total payout growth	0.0060 (0.351)	-0.0165 (-0.703)	0.0407 (1.210)	0.0040 (0.078)	-0.0305 (-0.238)	0.5058*** (3.223)	-0.0032 (-0.191)	-0.0221 (-0.939)	0.0052 (0.152)	-0.0307 (-0.622)	0.0063 (0.055)	0.2992*** (2.136)
Retained earnings to total equity							0.0825*** (2.625)	0.0634 (1.166)	0.0782 (1.306)	0.1761*** (2.198)	0.9057*** (3.252)	0.5820*** (2.384)
Book equity over total assets							0.0059 (0.986)	0.0006 (0.049)	0.0190* (1.766)	0.0032 (0.261)	0.0439 (0.641)	0.0842*** (2.413)
ROA							0.0009 (0.025)	0.1194** (2.289)	0.1163** (2.334)	0.5505*** (4.799)	0.8662*** (3.671)	0.9661*** (4.797)
Deposits over total assets							0.0368 (0.248)	0.3744 (1.531)	-0.2487 (-0.991)	0.6812 (1.370)	1.0012 (0.893)	0.1292 (0.145)
Short-term to total assets							0.3427 (1.217)	1.6065*** (3.494)	0.2724 (0.541)	1.0047 (1.329)	3.0194*** (1.984)	-0.8047 (-0.513)
Log total assets							-0.0118 (-1.220)	0.0213 (1.211)	-0.0185 (-0.910)	0.0106 (0.474)	-0.0723 (-0.770)	0.0051 (0.058)
Risk-weighted capital ratio							0.0057* (1.671)	-0.0009 (-0.169)	0.0056 (0.852)	0.0128 (1.522)	-0.0159 (-0.482)	0.0212 (0.767)
Interest to noninterest income							-0.0020 (-1.032)	-0.0008 (-0.261)	-0.0045* (-1.740)	-0.0039 (-1.206)	-0.0270 (-1.256)	-0.0219*** (-2.594)
Liquidity ratio							0.1634 (1.359)	0.3884** (2.025)	0.4147** (2.059)	-0.0517 (-0.230)	2.3647*** (2.427)	1.7456*** (2.226)
Market to book ratio							-0.0078 (-0.339)	0.0023 (0.063)	0.0532 (1.057)	0.0785 (1.474)	0.2159 (0.819)	0.4143*** (2.054)
Total asset growth (% year-on-year)							-0.1268 (-1.376)	-0.3233*** (-2.070)	-0.1406 (-1.018)	-0.1116 (-0.558)	1.3581 (1.267)	-1.6319 (-1.583)
Institutional ownership							-0.0700 (-0.984)	-0.1210 (-1.140)	0.0573 (0.455)	0.0729 (0.484)	-1.1168* (-1.740)	-0.6517 (-1.030)
Net interest paid on Fed funds and repos							-8.1517 (-1.127)	-22.2163*** (-3.678)	-3.5681 (-0.428)	-31.4910* (-1.723)	-0.3575 (-0.013)	10.5212 (0.566)
Constant	-0.1836*** (-18.797)	-0.2330*** (-13.775)	-0.1650*** (-9.742)	0.9185*** (35.086)	0.2751*** (3.113)	0.0109 (0.145)	-0.1378 (-0.476)	-1.2262** (-2.445)	-0.1148 (-0.195)	-0.8802 (-1.204)	-1.3843 (-0.461)	-2.9428 (-1.194)
Observations	353	349	354	353	349	355	353	349	354	353	349	355
Adjusted R ²	0.00%	0.00%	0.10%	0.00%	-0.30%	2.50%	11.90%	9.10%	7.10%	29.80%	15.20%	21.10%

Table 9: Dividend policy and insider trading

Panels A and B show measures of insider trading averaged across banks grouped according to their dividend behavior in each of the years 2006-2012. NPR count is the net purchase ratio calculated based on the number of trades placed, and NPR volume is the net purchase ratio calculated based on the number of shares bought and sold. % net buyers is the percentage of insiders that are net buyers of their firm's stock (i.e. buy more shares than they sell). Panel A shows the demeaned insider trading measures, which we obtain by subtracting the bank-level average from each of the measures. Panel B shows these three insider trading measures around dividend decreases, increases, and no changes in dividends for all of our sample period 1995-2012. The numbers are averages for each of the event years shown. Year 0 is the year in which the dividend decision takes place.

Panel A: Demeaned insider trading measures for banks with different dividend policies

Year	Dividend change behavior	NPR count	NPR volume	% net buyers
2006	Decrease dividends	-0.0592	-0.1227	-0.0242
	Increase dividends	-0.1758	-0.2022	-0.0887
	No change in dividends	-0.091	-0.0869	-0.0305
2007	Decrease dividends	0.1505	-0.1018	0.0196
	Increase dividends	0.0128**	0.0231**	0.0321
	No change in dividends	0.2168**	0.2956***	0.1581*
2008	Decrease dividends	0.4236***	0.4507***	0.2514***
	Increase dividends	-0.0675***	0.0106***	0.0213***
	No change in dividends	0.1827*	0.2062	0.128
2009	Decrease dividends	0.4065***	0.5434***	0.3183***
	Increase dividends	0.0466***	0.1078***	0.0912***
	No change in dividends	0.1452	0.163**	0.1153*
2010	Decrease dividends	0.1124	0.2498	0.1588
	Increase dividends	0.1044	0.1873	0.1264
	No change in dividends	0.0323	0.1721	0.046*
2011	Decrease dividends	0.3012	0.3962	0.2438
	Increase dividends	0.1124*	0.2184*	0.1631
	No change in dividends	0.2174	0.3465	0.211
2012	Decrease dividends	-0.1154	0.0285	-0.0348
	Increase dividends	0.0851*	0.2028*	0.0357
	No change in dividends	-0.0494	0.0193	-0.0177

Panel B: Changes in insider trading around dividend changes for the entire sample 1995-2012

Dividend decreases				Dividend increases				No changes in dividends			
Event	NPR	NPR	% net	Event	NPR	NPR	% net	Event	NPR	NPR	% net
year	count	volume	buyers	year	count	volume	buyers	year	count	volume	buyers
-3	0.292	0.156	0.56	-3	0.262	0.0769	0.525	-3	0.348	0.184	0.591
-2	0.345	0.218	0.605	-2	0.256	0.0746	0.522	-2	0.376	0.233	0.62
-1	0.412	0.278	0.616	-1	0.249	0.073	0.522	-1	0.384	0.252	0.615
0	0.392	0.294	0.51	0	0.256	0.0847	0.518	0	0.411	0.282	0.621
1	0.477	0.37	0.661	1	0.232	0.0573	0.492	1	0.403	0.277	0.568
2	0.455	0.361	0.621	2	0.225	0.0514	0.498	2	0.419	0.296	0.544
3	0.388	0.269	0.47	3	0.232	0.0615	0.509	3	0.379	0.267	0.555