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Profitability: The Role of Capital
Distribution Plans**

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Abstract

We investigate the impact of a change in the regulatory oversight of bank capital distributions on the information content of payouts (dividends, share repurchases) regarding the future level and volatility of profitability of US Bank Holding Companies (BHCs). Using a differential regulatory treatment, which requires large BHCs to obtain prior regulatory approval before enacting payouts to shareholders, we find that an increase in regulatory oversight of bank capital distributions leads to an increase in the information content of dividends (but not share repurchases) with respect to the level (but not the volatility) of future bank profitability.

Keywords: Banks; Bank Regulation; Capital; Dividends; Payouts; Profitability; Repurchases

1 Introduction

Prior evidence suggests that the level of payouts to shareholders contains valuable information regarding the level (Bhattacharya, 1979; Miller and Rock, 1985; John and Williams, 1985) and volatility of future profitability (Shapiro and Zhuang, 2015; Michaely, Rossi and Weber, 2021). However, during the global financial crisis of 2007-2009, the relevance of information embodied in payout announcements appeared less relevant, as banks continued to pay dividends and make share repurchases despite deteriorating earnings and declining capital (Acharya et al., 2011; Hirtle, 2016). Consequently, post-crisis changes to the regulatory environment have included (among a myriad of other measures) enhanced regulatory oversight of bank capital distributions.

In this study, we investigate the impact of a change in the regulatory oversight of bank capital distributions on the information content of payouts with respect to the future level and volatility of profitability. As a setting we use the US banking industry, and a 2012 amendment to Regulation Y of the 1956 Bank Holding Company Act, which requires large BHCs (with assets exceeding \$50 billion) to obtain prior regulatory approval before enacting payouts to shareholders. Against this backdrop, we test whether the regulatory oversight of bank capital distributions strengthens the relationship between: dividends and future profitability; and dividends and the volatility of future profitability. Selective empirical evidence suggests that dividend policy is driven by past earnings (Benartzi, Michaely and Thaler, 1997; Grullon et al., 2005). However, theoretical (Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985; Ofer and Thakor, 1987), empirical (Nissim and Ziv, 2001; Ham, Kaplan and Leary, 2020) and survey-based evidence regarding the determinants of dividend policy (Baker and Powell, 1999; 2000; Baker, Veit and Powell, 2001; Brav et al.,

2005) suggests that dividend payments convey important information regarding the future earnings of banks. We, therefore, expect that where banks seek regulatory approval for payouts based on forward-looking projections of revenues and losses, approved dividend payments should reflect more accurate information regarding future cash flows.

Our dataset (which straddles the change to Regulation Y of the 1956 Bank Holding Company Act in 2012) comprises annual financial accounts on 820 US bank holding companies over the period 2006-2017. In line with prior literature (Abreu and Gulamhussen, 2013; Srivastav, Armitage and Hagendorff, 2014; Johari et al., 2020), we conduct our analysis at the bank holding company level given that corporate policies, including payout policy, is determined at the parent level (Debbaut and Ennis 2014). We classify treated banks as those affected by the change in Regulation Y, and control banks as those unaffected by the amendment. Based upon this classification, we compare the degree of association in the level of bank payout with the level and volatility of future profitability between treated banks and control banks in the period before and after the amendment to Regulation Y.

By way of preview, we find that an increase in regulatory oversight (of bank capital distributions) leads to an increase in the information content of payouts with respect to the level (but not the volatility) of future bank profitability. Dividends paid by large bank holding companies subject to changes to Regulation Y provide greater information content for the subsequent level of profitability relative to smaller counterparts, which were unaffected by the regulatory change. That is, an increase in the dividends paid by large bank holding companies is associated with an increase in profitability in the following year. In contrast to dividends, the information conveyed by share repurchases remains unaffected by the changes to Regulation Y. These findings are robust to a battery of additional tests, the results

of which verify the internal validity of our estimated results. Moreover, we show that the estimated bank response to changes in Regulation Y is unaffected by various confounding events (such as the establishment of separate risk committees mandated by the Dodd-Frank Act) that occurred around the time of the amendment to Regulation Y. Finally, we also show that differences in asset size or ownership structure across the treated and control group of BHCs do not drive our main findings.

The results of this paper contribute to two strands of literature. First, we contribute to the literature that investigates the relationship between dividends and future bank performance. Keen (1978) shows that bank dividend reductions are followed typically by higher bank profitability. However, Boldin and Leggett (1995) and Hirtle (2004) provide evidence, which suggests that bank dividend increases are followed by higher profits and improved asset quality. More recently, Ham, Kaplan and Utke (2021) find that dividend payouts provide market participants with information regarding the level of permanent corporate earnings. We extend this literature to show that dividends predict the level of future bank profitability. We also show that increased regulatory oversight of capital distributions to shareholders augments existing information embodied in dividends regarding future bank profitability.

Second, we contribute to the literature that examines the effect of capital regulation on the information content of banks' capital management decisions. Prior literature investigates the impact of changes to capital regulation on bank equity issuance and dividends. For example, Polonchek, Slovin and Sushka (1989) and Li et al. (2016) show that a 1981 capital regulation and 2010 Dodd Frank Act, which enhanced regulatory capital requirements for US banks, both reduced the negative announcement effects associated with

security issuance. Moreover, Polonchek, Slovin and Sushka (1989) and Bessler and Nohel (1996) present evidence, which suggests that the 1981 capital regulation also lessened the negative announcement effects associated with dividend reductions. In contrast to these aforementioned studies, we use the 2012 amendment to Regulation Y for large bank holding companies, which allows us to test the impact of increased oversight of bank capital management decisions on dividend signaling. We find that the amendment to Regulation Y increased the information content of dividends regarding the future profitability of banks.

The rest of this paper proceeds as follows. Section 2 reviews related literature and presents testable hypotheses. Section 3 describes the methodology, while Section 4 discusses our dataset. Section 5 presents the main results and robustness checks. Section 6 concludes.

2 Hypothesis Development

Prior literature (via so-called signaling theories) suggests that dividend announcements contain valuable information regarding the future cash flow prospects of firms (Bhattacharya, 1979; Miller and Rock, 1985; John and Williams, 1985). Consequently, announcements of an increase (decrease) in dividends are likely to be followed by future increases (decreases) in profitability. Empirical evidence in support of the aforementioned proposition is rather mixed. For example, Nissim and Ziv (2001) and Ham, Kaplan and Leary (2020) present evidence, which suggests that firm profitability is positively associated with dividend increases, while Benartzi, Michaely and Thaler (1997) and Grullon et al. (2005) find no evidence for such a relationship.

In the banking industry, the discretion to pay dividends in order to signal future profitability may be constrained by: regulations designed to prevent wealth expropriation by shareholders; transfer of risk to debtholders; and taxpayer-funded government safety guarantees (Guntay, Jacewitz and Pogach, 2017). Prior to the global financial crisis of 2007-2009, US Bank holding companies (BHCs) could pay dividends without prior regulatory approval provided that they were well-capitalized, and that declared dividends did not exceed current earnings (Federal Reserve Board, 2009).¹ In 2012, an amendment to Regulation Y of the 1956 Bank Holding Company Act required large BHCs (with assets exceeding \$50 billion) to obtain prior regulatory approval before returning cash to shareholders. The amendment stipulates that large BHCs must submit an annual comprehensive capital plan, which incorporates forward-looking projections of revenues and losses, and any substantive capital distributions.² Supervisory objections may arise if any proposed capital distributions are likely to threaten the safety and soundness of the BHC. As a consequence, regulatory approval or non-approval of proposed capital distributions is likely to augment any information regarding the future prospects for bank performance following an announcement of increased or decreased dividends. Therefore, our first hypothesis is as follows:

H1: *Regulatory oversight of capital distributions strengthens the relationship between bank dividends and future profitability.*

¹ Routine dividends made from sustained and recurring earnings do not require BHCs to obtain prior supervisory approval.

² See Section 4B (Mandatory Elements of a Capital Plan) in the final rule of Regulation Y by Federal Reserve Board (2011).

Other than signaling the level of future profitability, dividend announcements may also provide relevant information regarding the volatility of future profitability. Prior studies that investigate the relationship between dividends and the volatility of earnings predict that managers increase dividends when earnings are less volatile (Grullon, Michaely and Swaminathan, 2002; Shapiro and Zhuang, 2015; Michaely, Rossi and Weber, 2021). Lie (2005) shows that dividend increases are associated with lower future earnings volatility. In a recent study, Michaely, Rossi and Weber (2021) show both theoretically and empirically that lower expected earnings volatility is associated with higher dividends. The authors argue that managerial commitment to paying dividends is stronger if expected future earnings are stable. Survey evidence also confirms earnings persistence following dividend payout (Lintner, 1956; Brav et al., 2005).

The 2012 amendment to Regulation Y may augment any signal regarding future profits volatility following a dividend announcement. Furlong and Keeley (1989) argue that bank capital regulation incentivizes value-maximizing banks to reduce risk. Given that capital plans undergo a number of stress scenarios prior to regulatory approval, it is less likely that bank managers will set dividends based upon overly optimistic earnings projections. Therefore, any approval of a change in dividends made by the board of directors is likely to be mindful of both the future volatility of profits and potential regulatory scrutiny. This is consistent with the survey evidence that managers commit to paying high dividends only if they are confident that future cash flows will be realized (Lintner, 1956; Brav et al., 2005). Similarly, the improved capital monitoring via amendments to Regulation Y could have an impact on how managers project future revenues and losses, which should now be based upon both likely and less likely economic conditions. The amendment also requires

banks to provide pro-forma leverage, risk-based and total capital ratios that account for bank asset portfolio risk. As such, these projected capital levels may also reflect a lower level of asset risk, which may in turn decrease the volatility of bank profitability. In light of the above discussion, our second hypothesis is as follows:

H2: *Regulatory oversight of capital distributions strengthens the relationship between bank dividends and the volatility of future profitability.*

Share repurchases (as an alternative to dividends means of distributing cash to shareholders) have seen a sharp increase in use over the past twenty years (Hirtle, 2004; Floyd, Li and Skinner, 2015; Michaely and Moin, 2022). A priori, obtaining prior regulatory approval ahead of capital distributions is likely to influence the information content of share repurchases regarding future profitability in a similar fashion to dividends (assuming the two forms of payout are substitutes). However, recent evidence suggests that firms do not necessarily view dividends and repurchases as substitutes (Brav et al., 2005; Grullon and Michaely, 2004).

A growing body of empirical evidence suggests that firms use dividends to distribute permanent cash flows to investors, while share repurchases are used independently of dividends in order to distribute the transient component of firm cash flows (Guay and Harford, 2000; Jagannathan, Stephens and Weisbach, 2000; Lee and Rui, 2007). Consequently, share repurchases may not convey the same type of informational signal as dividends. Based upon insights from the aforementioned literature our third and fourth hypotheses, stated in the alternate, are as follows:

H3: *Regulatory oversight of capital distributions strengthens the relationship between bank share repurchases and future profitability.*

H4: *Regulatory oversight of capital distributions strengthens the relationship between bank share repurchases and the volatility of future profitability.*

3 Identification, Model Specification, and Data

This section provides a brief background to the 2012 amendment to Regulation Y, which is used as a setting to test our research hypotheses (Section 3.1). This is followed by the discussion of our estimable model (Section 3.2), data set (Sections 3.3) and information regarding the variables used in the empirical analysis (Section 3.4).

3.1 Regulation Y and bank capital plans

In 2012, the Federal Reserve amended rules contained in Regulation Y of the 1956 Bank Holding Company Act that govern the corporate policies of bank holding companies.³ This amendment imposes tighter restrictions on large bank holding company capital distribution policy, while leaving requirements for smaller bank holding companies unchanged.⁴ In particular, the amendment requires large bank holding companies with consolidated assets exceeding \$50 billion to submit comprehensive capital plans to the Federal Reserve by 5th January each year.⁵ The Federal Reserve can make a decision to object by March 31st.⁶

³ Bank Holding Companies and Change in Bank Control or Regulation Y (12 CFR Part 225) is aimed to govern the corporate practices of bank holding companies and certain practices of state-member banks. See: <https://www.frbsf.org/banking/regulation/regulations-policies-guidance/reg-y/>.

⁴ For more extensive information on the amendment made on December 30, 2011, refer: <https://www.federalregister.gov/documents/2011/12/01/2011-30665/capital-plans>.

⁵ Using FR Y-14A and FR Y114Q forms, these banks are required to report the data needed for capital plan assessment including financial condition, structure, assets, risk exposure, policies and procedure, liquidity and management.

⁶ This timing is set to give banks sufficient time to pay dividends (or buy back shares) in the first quarter of each year without any distortions that might arise from awaiting approval from the Federal Reserve.

During the assessment period, regulators decide whether banks can proceed with proposed capital distribution plans. One of the components assessed by the Federal Reserve is the expected use and source of capital over the planning horizon under normal and stressed economic conditions. The regulator then conducts several tests to examine various hypothetical conditions banks might face in the future regarding their respective projected revenues, losses, and capital. If the results of these tests are satisfactory, the Federal Reserve provides permission for a bank to proceed with planned capital distributions.⁷

Any proposed capital distribution plan is likely to be rejected if a bank fails to maintain capital above regulatory minima under normal and stressed economic scenarios. Any capital distribution plan may also be rejected if any proposed dividends constitute an unsafe and unsound practice as stipulated under the Federal Reserve regulation. In case of objections, banks must resubmit revised capital plans within a specified time period in order to proceed with capital distribution. As mentioned above, the amendment to Regulation Y only applies to bank holding companies with assets exceeding \$50 billion, leaving banks below this threshold unaffected. Using this criterion, we classify treated banks (banks with asset exceeding \$50 billion) and control banks (banks with less than \$50 billion assets) based on total assets. Such a classification allows us to assess how the information content of the dividend (and share repurchase) of affected bank holding companies relative to unaffected counterparts changes following an increase in regulatory oversight.

⁷ This non-objection is extended through the first quarter of the following year. This is to avoid any interruption in the ability of banks to make capital distributions in the first quarter of the following year due to the concern on the timing of capital plan submission and review processes. In a case of re-submission of a capital plan after the first quarter, the non-objection is extended to the first quarter of the following year.

Prior to 2012, Regulation Y required that BHCs that: were under-capitalized; had unresolved supervisory issues; or intended to pay dividends in excess of their current earnings, had to notify the Federal Reserve of payout plans – in case these would materially reduce a BHC’s net worth. BHCs to whom these applied were required to go through a supervisory consultation process prior to initiating dividend payments or repurchases. In 2009, a supervisory note issued by the Federal Reserve Board reiterated existing guidelines on bank dividends and paved the way for increasingly tighter restrictions for bank dividend issuance and repurchases. This culminated in amendments to Regulation Y in 2012 (Federal Reserve Board, 2009). In a supervisory note, the Federal Reserve Board expressed heightened expectations that BHC would inform and consult with supervisors in advance of declaring dividends that could raise concerns regarding bank safety and soundness.

3.2 Model specification

To investigate the relationship between increased regulatory oversight (via the amendment to Regulation Y) and payout signaling, we estimate the following model:

$$\begin{aligned}
Perf_{i,s,t} = & \alpha + \beta_1.Payout_{i,s,t-1} + \beta_2.(Payout * Post Y)_{i,s,t-1} \\
& + \beta_3.(Payout * Affected)_{i,s,t-1} + \beta_4.(Post Y * Affected)_{i,s,t-1} \\
& + \beta_5.(Payout * Post Y * Affected)_{i,s,t-1} + \delta.X_{i,s,t-1} + \varphi.GSP_{s,t} \\
& + \nu_i + \gamma_t + \epsilon_{i,s,t}
\end{aligned} \tag{1}$$

where i indexes banks, s indexes states, and t indexes years. $Perf_{i,s,t}$ is return on equity (ROE) and the volatility of return on equity (ROE Volatility). ROE is calculated as net income normalized by total equity capital. The use of ROE as our proxy for profitability is motivated by prior research that investigates the relationships between dividends and future earnings (Benartzi, Michaely and Thaler, 1997; Nissim and Ziv, 2001; Hirtle, 2004). We compute ROE

Volatility using a three-year rolling ROE (De Haan and Poghosyan, 2012; Schaeck et al., 2012). Specifically, we use the net income in years $t=0$, $t=1$, and $t=2$ to compute the standard deviation of bank earnings. The intuition behind this is that dividends are paid when managers predict stable cash flow over the next few years. $Payout_{i,s,t-1}$ denotes either dividends or share repurchases. In line with prior literature, dividends are calculated as total cash dividends paid to common shareholders divided by total equity capital (Kanas, 2013; Onali, 2014; Onali et al., 2016). Following Hirtle (2016), we define share repurchases as the sum of treasury stock purchases and net conversions and retirement of common stock (if positive) divided by total equity capital. *Post Y* is a dummy variable that equals one after 2011, zero otherwise. This dummy variable indicates the post-treatment period of the Regulation Y amendment that came into effect in 2012. *Affected* is a dummy variable that equals one for large bank holding companies with consolidated assets exceeding \$50 billion at the end of fiscal year 2011 and zero otherwise.⁸ This variable reflects the Regulation Y requirements on large bank holding companies above the specified asset threshold. $X_{i,s,t-1}$ is a vector of bank-specific variables (*Size*, *Asset Growth*, *Capitalization*, *Loans to Asset*, and *Loan Loss Provisions*) and market characteristics (*HHI Loans*), which are likely to affect bank profitability. Finally, $GSPgr_{s,t}$ is the real gross state product growth rate, which is included to control for differences in economic performance across states. Further details related to these variables are provided in Section 3.4. Our model also includes bank specific fixed effects, v_i , to account for unobserved bank level heterogeneity as well as time dummies, γ_t , to capture time effects common to all banks. $\epsilon_{i,s,t}$ is the regression error term.

⁸ As discussed, the amendment became effective on December 30, 2011, and banks submitted their first capital plans in the first quarter of 2012. Hence, we classify the affected banks based on their assets as of end 2011.

Estimation of Equation (1) is conducted using Ordinary Least Squares, with standard errors that are robust to heteroscedasticity and clustered at the bank level to control for within-bank correlation. The coefficient on the triple interaction term, β_5 , is the coefficient of interest. This coefficient captures the difference in the relationship of payout and future profitability between affected and unaffected banks following the amendment of Regulation Y.

3.3 Data

In order to test our hypotheses, we collect annual data of US bank holding companies (BHCs) over the period 2006-2017.⁹ This period is determined primarily by the amendment to Regulation Y on December 30th, 2011. This divides our sample into a balanced pre- and post-amendment time period. We collect our data from FR Y-9C consolidated regulatory financial statements filed with the Federal Reserve. These consolidated regulatory data provide information on annual cash dividends paid to common shareholders, the number of common shares outstanding, the amount spent on share repurchases, and other accounting variables.

To construct our sample, we identify top tier BHCs that are headquartered in US territories. We omit bank-observations if data on total assets, total equity and dividends are missing or negative. We also omit bank-observations if data on number of shares outstanding are missing or non-positive. Given that our investigation focuses on the impact of an amendment to Regulation Y, the sample is limited to banks that file regulatory reports

⁹ Throughout the remainder of the paper, we interchangeably use the term “bank holding company” and “bank” for convenience.

in consecutive years during the pre- and post-amendment period. Our selection procedure yields 1047 BHCs with 7293 bank-year observations. Among these banks, 500 (48%) are listed banks and another 547 (52%) are non-listed banks. For our analysis using the amendment to Regulation Y, we classify 30 banks as treated (with consolidated assets exceeding \$50 billion at the end 2011 fiscal year) and 1017 banks in the control group.

3.4 Variables and summary statistics

We include several bank-specific variables, which according to prior literature are likely to determine profitability. First, we control for bank size (*Size*) as measured by the natural log of total assets. Sources of large bank profitability may stem from economies of scale, market power, brand image, and preferential regulatory and supervisory treatment (Smirlock, 1985; Demirgüç-Kunt and Huizinga, 2000; Goddard, Molyneux and Wilson, 2004a; 2004b). However, large banks may report lower profitability if diseconomies are prevalent at higher levels of production. Consequently, the expected relationship between bank size and profitability could be positive or negative. Second, we introduce *Asset Growth* to our model as a proxy for bank growth (Chronopoulos et al., 2015). This variable is measured using the year-on-year percentage change in bank total assets. The expected relationship between asset growth and bank profitability is ambiguous. On the one hand, the increase in bank assets such as loans may increase bank profitability if loans are managed efficiently. On the other hand, if growth is driven by an increase in low quality assets, profitability could be adversely affected. Third, we account for bank capitalization using the ratio of bank equity capital to total assets. Previous literature suggests that bank capital reduces profitability because higher capital implies that banks are less risky, which leads to

lower returns (Goddard et al., 2013). In contrast, higher capital may also increase bank profitability because safer banks benefit from lower uninsured funding costs (Berger, 1995; Goddard, Molyneux and Wilson, 2004a). We also control for bank balance sheet structure by using *Loans to Asset* ratio. Banks with higher loans may enjoy informational advantages and lower intermediation costs, which feed through to higher profits. Consistent with this, Demirgüç-Kunt and Huizinga (1999) show that banks with high interest earning assets are more profitable. We also include a proxy for loan portfolio risk using the ratio of loan loss provisions to total assets (*Loan Loss Provisions*). A higher ratio (indicative of lower asset quality) would lead to a decline in bank profitability (Athanasoglou, Brissimis and Delis, 2008; García-Herrero, Gavilá and Santabárbara, 2009).

We also control for the market structure facing banks (Gilbert, 1984; Berger et al., 2004). To this end, we construct the *Herfindahl-Hirschman Index (HHI) Loans* at the state level using loan market share. A higher index indicates a more concentrated banking market at the state level. The expected relationship between *HHI Loans* and *ROE* is ambiguous. Lower market concentration may increase bank efficiency and reduce operational costs. Thus, resulting in higher profitability. However, lower concentration may also reduce profitability due to greater price competition among banks, and subsequent squeezing of profit margins. Finally, we include a macroeconomic indicator that measures economic performance at the state level as proxied by the growth rate of real gross domestic product (*GSPgr*). This controls for economic fluctuations, which are likely to influence banks' ability to generate revenues that contribute to profitability (Albertazzi and Gambacorta, 2009). Table 1 summarizes the definitions and sources of these variables. Table 2 tabulates the summary statistics. The mean value of return on equity (*ROE*) for all banks in our sample is

4.71%, while the median value is 8.2% (not reported). This suggests that the distribution is slightly skewed to the left. The mean value of *Dividend* is 3.18%. Comparing the dividend for both groups of banks, unaffected banks, on average, pay more dividends than affected banks (3.21 and 2.4 respectively). Table 3 provides correlations between of all variables used.

4 Results

This section discusses the main empirical results (Section 4.1) and robustness checks (Sections 4.2 to 4.4).

4.1 Regulation Y and bank dividend signalling

Table 4 reports the results of estimating Equation (1). In columns 1 and 2, we present the estimates of Equation (1) with dividends and share repurchases, as payout methods employed by the banks, and the level of future profitability as the outcome variable. We find that the coefficient of the triple interaction term, β_5 , reported in column 1 is positive and statistically significant at the 5% level. This suggests that a positive link between dividends and future profitability strengthens following the amendment to Regulation Y. This result is consistent with our first hypothesis (H1), which predicts that increased regulatory oversight increases the information content of dividends regarding future profitability. This result is also in line with prior literature, which suggests that capital regulation plays a key role in influencing bank dividend signaling (Polonchek, Slovin and Sushka, 1989; Bessler and Nohel, 1996). We find that dividends are more positively related to future earnings following increased scrutiny of bank capital distribution plans. Moreover, the results suggest a positive relationship between dividends and future earnings for the affected banks (with the marginal effect of dividends on future earnings being equal to 0.9).¹⁰ Column 2 provides

¹⁰ The marginal effect of dividends on future earnings is calculated as the sum of β_1 , β_2 , β_3 and β_5 .

evidence on whether banks also use share repurchases to convey information regarding future profitability. The coefficient of the triple interaction term, β_5 , while positive, is statistically indistinguishable from zero at the conventional levels of significance. This result is in line with the notion that share repurchases are used as a means for paying out the transient component of earnings (Guay and Harford, 2000; Lee and Rui, 2007; Skinner, 2008).

In columns 3 and 4 of Table 4, we re-estimate Equation (1) using *ROE Volatility* as the outcome variable. In doing so, we investigate whether the amendment to Regulation Y changes the relationship between bank payout and the volatility of future profitability. The results for dividends and share repurchases are reported in columns 3 and 4 of Table 4, respectively. The coefficient on the triple interaction term reported in either column 3 or column 4 is indistinguishable from zero. This finding runs contrary to prior documented evidence of signaling content in dividends regarding the volatility of future cash flows (Brav et al., 2005; Michaely, Rossi and Weber, 2021), and as such does not lend support to our second hypothesis (H2).

The coefficients of control variables are in line with our prior expectations. Based on columns 1 and 2 (columns 3 and 4), the coefficients of *Size*, *Capitalization*, and *Loan Loss Provisions* are negative (positive) and highly statistically significant. These suggest that larger, more capitalized, and riskier banks are less profitable (higher earnings volatility). In contrast, *GSP* is statistically significant only in the case of future profitability (columns 1 and 2), entering the regression with a positive coefficient. This suggests that more buoyant economic conditions have a positive impact on bank profitability.

[Insert Table 4 about here]

4.2 Confounding factors

The results obtained in Section 4.1 suggest that the relationship between dividends and future earnings is positive, and that the enactment of regulation Y further strengthens this relationship for the affected banks. Nevertheless, these results could be driven by confounding factors that influence the main outcome variables, and therefore threaten the internal validity of our approach. A particularly important potential factor that may also improve the information content of dividends is the passage of the Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). Specifically, Section 165(h) required publicly listed banks with assets exceeding \$10 billion to establish independent risk committees to oversee overall bank risks.¹¹ Such risk committees can increase risk awareness by providing the board with relevant information, which facilitates improvements in operational and strategic decision making. Although this requirement does not specifically focus on bank capital distributions, it may cause banks to take more conservative decisions regarding the distribution of capital to shareholders. In order to explore this possibility, we replace the variables *Post Y* and *Affected* with: *Post IRC*, a binary variable that equals one for years 2011 and beyond, and zero otherwise; and *IRC*, a binary variable that takes the value of one if a bank is publicly listed with assets exceeding \$10 billion at the end 2010 fiscal year, and zero otherwise respectively. Subsequently, we re-estimate Equation (1) using a restricted sample of banks with assets below \$50 billion.¹² That is, we exclude those banks defined as treated in our main analysis from the sample to

¹¹ Bouwman, Hu and Johnson (2018) provide a brief review about this Act from BHC perspective. For more extensive information, see “Summary of Dodd-Frank Financial Regulation Legislation” by David S. Huntington at: <https://corpgov.law.harvard.edu/2010/07/07/summary-of-dodd-frank-financial-regulation-legislation/>

¹² In estimating Equation 1 we exclude banks with assets in excess of \$50 billion to ensure that the results are not driven by the treated banks of our main analysis.

avoid biasing the results of this test, since Section 165(h) of the Dodd Frank Act was binding for them. If the requirement to establish independent risk committees confounds our main results, we should find a statistically significant coefficient on the triple interaction term. Columns 1 to 4 of Table 5 present the results of this analysis when considering both means of payout and the outcome variables are *ROE* and *ROE Volatility*. The coefficient of interest is statistically insignificant in all cases. This implies the requirement to establish independent risk committees is unlikely to confound the effect of the amendment to Regulation Y on the information content of dividends.

Another confounding event that may influence bank dividends are the capital injections made by the US Treasury Office of Financial Stability via the Trouble Asset Relief Program (TARP) in October 2008. Under the terms of this program, which included refraining from raising dividends or repurchasing shares, participating banks received a certain amount of capital through the purchase of preferred stock and equity warrants under the Capital Purchase Program (CPP). Therefore, TARP may have introduced a disconnect between the level of dividends and the future performance of banks in receipt of TARP funds. As banks repaid funds received from the government, their payout policies were no longer subject to the terms of the TARP. As such payout policies could again reflect managerial views regarding future bank performance. To ensure that our results are not biased by those banks exiting TARP, we re-estimate Equation (1) while explicitly controlling for TARP. In order to do so we saturate our baseline model with the variables *TARP Duration*, *TARP Bank*, and their interactions with *Payout*. *TARP Duration* is a binary variable that equals one for the years a bank received government funding. *TARP Bank* equals one if banks participated in TARP, and zero otherwise. The results of this test for both forms of payout are presented in

columns 5 to 8 of Table 5. The coefficient on the triple interaction term *Dividends (Repurchases) × TARP Duration × TARP Bank* enters the regression positively and statistically insignificantly (significantly) when *ROE* is the outcome variable, while the coefficient on the triple interaction term of interest *Dividends (Repurchases) × Post Y × Affected* retains its sign and statistical significance. A similar picture emerges when *ROE Volatility* is used as the outcome variable. This suggests that our baseline results are unlikely to be driven by TARP capital injections.

[Insert Table 5 about here]

4.3 Placebo test

Next, we examine the so-called parallel trend assumption. That is, the identifying assumption behind the difference-in-differences approach (Roberts and Whited, 2013). Under this assumption, the behavior of affected banks should have evolved in the same manner as the unaffected banks in the absence of treatment (the amendment to Regulation Y). In order to check whether the parallel trend assumption holds, we repeat the analysis during a period when there was no amendment to Regulation Y. We assume falsely that the amendment to Regulation Y occurred in 2008 - four years prior to the actual amendment. Table 6 presents results of this test for both forms of payout, and when the outcome variables are *ROE* and *ROE Volatility*. None of the coefficients on the triple interaction term (*Dividend*Placebo Post Y*Affected*) are statistically significant, indicating that the parallel trend assumption holds.

[Insert Table 6 about here]

4.4 Other sensitivity tests

To provide additional insights, we also examine whether certain groups of banks in our sample are driving our results. Given that our main findings suggest a link between future performance and dividends rather than repurchases, our sensitivity analysis focuses only on dividends.

Ownership

First, we consider the possibility that ownership structure could bias our findings, given that our main analysis is based on a comparison of the future earnings-dividend link between a treated group that overwhelmingly comprises publicly traded banks and a control group that comprises both public and privately held banks. Prior literature suggests that public and private firms exhibit differences in dividend behaviors (Michaely and Roberts, 2012). Consequently, differences in ownership structure could also influence the dividend signaling of banks. To alleviate such concerns, we re-estimate Equation (1) excluding privately held banks from the sample. The results of this test are presented in column 1 of Table 7 and are consistent with our main findings.

Asset Size

Second, in column 2 of Table 7, we address the possibility that our results are driven by banks included in our control group that are relatively small in size compared to the treated banks. To investigate this possibility (and following the Federal Reserve's total assets threshold for small bank holding companies), we restrict our sample to banks with total assets exceeding \$1 billion.¹³ That is, we essentially restrict the control group to include

¹³ In 2015 the Federal Reserve raised the threshold for small banks in its Small Bank Holding Company Policy Statement from \$500 million to \$1 billion.

banks with assets between \$1 billion and \$50 billion.¹⁴ The results of this analysis are also consistent with our main findings.

Changes in the Composition of Treated and Control Group BHCs

We also consider the possibility that our results are confounded by changes in the composition of the treated and control groups, given that bank size may change and thus cross the \$50 billion size threshold following the amendment to Regulation Y. Indeed, one of our control banks surpassed the \$50 billion threshold for a year, and another for two consecutive years, before dropping below the threshold again, in the post-treatment period.¹⁵ Four more banks crossed the \$50 billion threshold after 2011. Although the 26 bank-year observations for which these six banks were subject to Regulation Y amendments are unaccounted for in our analysis, they could only bias our results against finding support for our hypothesis. Nevertheless, we re-estimate Equation (1) excluding these six banks from the sample. The results (presented in column 3 of Table 7) are consistent with our main findings.

Alternative Measures of Dividends

Finally, we investigate the robustness of our results to the use of alternative dividend measures. We employ both the change in dividends and a binary indicator capturing dividend increases as opposed to that of the levels used throughout our analysis. Specifically, we re-estimate Equation (1) after replacing *Dividend* with *Change in Dividend (Dividend Increase)* defined as the difference in cash dividends paid to common shareholders in the current year and those in the previous year scaled by total equity (a dummy variable that

¹⁴ There are 32 control banks with assets between \$10 billion and \$50 billion as of end 2011 fiscal year. The treated banks remain 26 as in our main analysis.

¹⁵ These banks are: New York Community Bankcorp, Inc. (in 2015), and CIT Group Inc. (in 2015 and 2016).

equals one if banks increase their dividend payout ratio, and zero otherwise). The results derived from using these two dividend measures are presented in columns 4 and 5 of Table 7. The coefficients of interest retain sign and are significant at the 1% level. This implies that our main results are robust to using alternative dividend measures.

We also replicate our five sensitivity checks (described above) using ROE Volatility as the outcome variable. The results are reported in columns 6 to 10 of Table 7. For all tests, we find that the main coefficients of interest, β_5 , are statistically insignificant. This further confirms that hypothesis H2 is not supported.

5 Conclusion

In this paper, we investigate whether an increase in regulatory oversight augments the information content of dividends regarding the level and volatility of future bank profitability. Using the 2012 amendment to Regulation Y of the 1956 Bank Holding Company Act (that requires banks with assets exceeding \$50 billion to submit comprehensive annual capital plans) we show that increased regulatory oversight improves the information content of dividends regarding the future level of bank profits.

To the best of our knowledge, this is the first study to assess the impact of regulatory oversight on bank dividend signaling following the amendment to Regulation Y. Prior literature has examined the effects of capital regulation on dividend announcement effects, but not the relationship between dividends and future profitability. This paper makes an important contribution to the bank dividend literature by showing that regulation plays a vital role in certifying the financial condition of banks via dividend approvals. Hence, increased regulatory oversight of bank capital distributions provides more information to investors and depositors regarding the future level of bank profitability following dividend

announcements. Our findings are also consistent with regulatory guidelines that require banks to consider capital and earnings prospects when paying dividends (Federal Reserve Board, 2017). Consequently, our findings reinforce the importance of regulatory oversight, which encourages banks to pay dividends to shareholders that are based upon realistic projections of future profitability.

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Table 1: Variable definitions and sources

Variables	Definition	FR Y-9C Items
Return on Equity (ROE)	Bank profitability proxy measured by net income to total equity capital (%)	BHCK4340/ BHCK 3210
ROE Volatility	The volatility of ROE measured by the standard deviation of ROE in three years (year zero to year two)	BHCK4340/ BHCK 3210
Dividends	Cash dividends paid to common shareholders in a calendar year divided by total equity capital (%)	BHCK4460/ BHCK 3210
Repurchases	Repurchases payout ratio measured as the sum of treasury stock purchases and the net conversions and retirement of common stock (if positive) in a calendar year divided by total equity capital (%)	(BHCK3580+ BHCK4783)/BHCK3210
Post Y	A binary variable that equals one in years 2012 and beyond reflecting the amendment of Regulation Y in 2012	Own construction
Affected	A binary variable that equals one for banks with total consolidated assets of more than \$50 billion in fiscal year 2011	Own construction
Size	Bank size proxy measured by the natural logarithm of bank total assets	BHCK2170
Asset Growth	The growth rate of bank assets measured by the change of bank assets from previous year divided by the assets of previous year (%)	BHCK2170
Capitalization	Bank capitalization as measured by total equity capital to total assets (%)	BHCK3210/BHCK2170
Loans to Assets	Proxy for banks liquidity and lending specialization as measured by total loans divided by total assets (%)	BHCK2122/BHCK2170
Loan Loss Provisions	Loan loss provision to total asset ratio as a proxy for bank expectation of loan losses	BHCK4230/BHCK2170
HHI Loans	The proxy of bank market concentration as measured by bank market shares on loans at state level	BHCK2122
GSPgr	The macroeconomic performance indicator as measured using the growth rate of real gross domestic product at state levels (%)	Bureau of Economic Analysis
Dividend Change	Change in cash dividends paid to common shareholders scaled by total equity in previous year ($\times 100$)	Own construction
Dividend Increase	Binary variable indicating if a bank increased its dividends or not	Own construction

Note: This table provides the definitions and sources of variables used in this paper.

Table 2: Summary statistics

Variables	All banks					Affected banks					Unaffected banks					Diff.
	N	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max	
ROE	7293	4.713	26.573	-982.6	117.35	288	6.928	9.039	-57.9	28.467	7005	4.621	27.048	-982.6	117.35	2.307***
ROE Volatility	7293	15.085	143.71	0.001	7208.48	288	3.734	5.294	0.024	38.230	7005	15.551	146.62	0.001	7208	-11.8***
Dividends	7293	3.187	4.060	0	55.604	288	2.400	2.384	0	13.365	7005	3.219	4.112	0	55.604	-0.81***
Repurchases	7293	1.082	3.329	-0.276	82.645	288	3.016	4.575	0	40.466	7005	1.002	3.244	-0.276	82.645	2.014***
Size	7293	14.442	1.417	11.119	21.668	288	19.212	1.128	17.349	21.668	7005	14.246	1.032	11.119	20.376	4.966***
Asset Growth	7293	7.299	15.420	-56.228	446.98	288	6.222	15.338	-27.85	127.58	7005	7.343	15.423	-56.22	446.98	-1.121
Capitalization	7293	9.755	4.103	0.412	78.533	288	10.722	2.331	4.731	18.937	7005	9.715	4.155	0.412	78.533	1.007***
Loans to Assets	7293	66.775	13.471	0.071	96.211	288	54.519	21.991	4.645	85.178	7005	67.279	12.755	0.071	96.211	-12.7***
Loan Loss Provisions	7293	0.515	0.897	-1.542	15.441	288	0.640	0.831	-0.171	4.860	7005	0.510	0.899	-1.542	15.441	0.131***
HHI Loans	7293	0.314	0.231	0.043	1	288	0.451	0.248	0.107	0.955	7005	0.309	0.228	0.043	1	0.142***
GSPgr	7293	1.250	2.445	-8.415	22.238	288	1.206	2.020	-4.429	8.547	7005	1.252	2.461	-8.415	22.238	-0.046
Dividend Change	7293	0.071	2.880	-43.97	42.583	288	-0.014	1.398	-9.870	4.289	7005	0.074	2.925	-43.97	42.583	-0.089
Dividend Increase	7293	0.518	0.499	0	1	288	0.684	0.465	0	1	7005	0.511	0.499	0	1	0.172***

Note: This table presents the summary statistics of 820 US bank holding companies in our sample from 2006 to 2017. We also present separate statistics for the affected and unaffected banks. The last column reports the difference and significance of the difference in means test (t-test) between affected and unaffected banks. The definitions of these variables are given in Table 1. *, **, and *** denote significance levels at 10%, 5%, and 1%, respectively.

Table 3: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ROE (1)	1.00											
ROE Volatility (2)	-0.15	1.00										
Dividends (3)	0.19	0.01	1.00									
Repurchases(4)	0.009	0.006	0.01	1.00								
Size (5)	0.04	-0.03	-0.02	0.12	1.00							
Asset Growth (6)	0.16	-0.01	0.009	-0.005	0.08	1.00						
Capitalization (7)	0.17	-0.06	0.03	0.01	0.15	0.04	1.00					
Loans to Assets (8)	-0.03	0.04	-0.02	-0.03	-0.20	0.08	-0.19	1.00				
Loan Loss Provisions (9)	-0.45	0.10	-0.02	-0.02	-0.001	-0.16	0.02	0.14	1.00			
HHI Loans (10)	-0.04	-0.008	-0.05	0.03	0.09	0.03	0.04	0.06	0.02	1.00		
GSPgr (11)	0.18	-0.04	0.07	0.01	0.03	0.06	0.06	-0.06	-0.25	-0.07	1.00	
Dividend Change (12)	0.12	-0.04	0.31	0.01	0.01	0.08	0.04	-0.1	-0.16	-0.01	0.13	1.00
Dividend Increase (13)	0.20	-0.05	0.31	0.01	0.15	0.13	0.07	0.07	-0.01	-0.26	0.02	0.38

Note: This table tabulates the correlation between variables. ROE is return on equity while ROE Volatility is the 3-year rolling standard deviation of ROE. Dividends is the dividend to equity ratio. Repurchases is the share repurchases to equity ratio. Size is bank size measured by natural log of total assets. Capitalization is measured by total equity capital divided by total assets. Loans to Assets is total loans to total asset ratio. Loan Loss Provisions is the ratio of loan loss provisions to total assets. HHI Loans is Herfindahl-Hirschman Index based on bank loan market shares as proxy for market concentration. GSPgr is the growth rate of real gross domestic product at the state level. Dividend Change is the change in dividend to previous year's total equity. Dividend Increase is a binary variable indicating an increase in dividend relative to previous year. Detailed definitions of these variables are presented in Table 1.

Table 4: Regulation Y and bank payout signalling

Dependent variables:	ROE	ROE	ROE	ROE
	(1)	(2)	Volatility	Volatility
	(1)	(2)	(3)	(4)
Dividends	0.173 (0.302)		0.150 (0.195)	
Dividends*Post Y	-0.206 (0.211)		-0.659*** (0.195)	
Dividends*Affected	-2.619*** (0.781)		0.742* (0.430)	
Post Y*Affected	-19.759*** (6.334)		-1.765 (1.603)	
Dividends*Post Y*Affected	3.406** (1.693)		-0.359 (0.596)	
Repurchases		2.360 (2.663)		-2.627 (2.832)
Repurchases *Post Y		-2.305 (2.492)		2.025 (2.558)
Repurchases *Affected		-2.934 (2.705)		2.819 (2.826)
Post Y*Affected		-15.988*** (4.835)		-2.023 (1.410)
Repurchases*Post Y*Affected		3.503 (2.615)		-2.225 (2.604)
Size	-18.279*** (4.301)	-15.526** (6.206)	13.676** (5.430)	7.210*** (2.351)
Asset Growth	0.161 (0.151)	0.150 (0.148)	-0.098 (0.108)	-0.076 (0.093)
Capitalization	2.787 (1.781)	2.848 (1.791)	-0.093 (0.470)	-0.209 (0.537)
Loans to Asset	0.453 (0.324)	0.418 (0.300)	0.211 (0.143)	0.281** (0.109)
Loan Loss Provisions	-21.720*** (3.812)	-21.781*** (3.808)	0.322 (1.042)	0.586 (1.008)
HHI Loans	7.124 (7.063)	4.817 (8.003)	-14.447** (5.887)	-10.822 (7.242)
GSPgr	2.559*** (0.660)	2.674*** (0.613)	-0.868*** (0.335)	-1.017** (0.435)
Constant	208.496*** (49.910)	169.813** (86.107)	-189.298*** (67.156)	-98.859*** (37.171)
Bank fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	7293	7293	6264	
No. of banks	1,047	1,047	944	
Adjusted R-squared	0.02	0.02	0.02	0.02

Note: This table presents the results investigating the effects of Regulation Y amendment on bank dividend signalling. Dependent variables are return on equity (ROE) and the volatility of return on equity (ROE Volatility). ROE Volatility is calculated using three year rolling standard deviation of return on equity. Dividends are cash dividends to equity ratio. Repurchases are share repurchases to equity ratio. Post Y is a dummy variable that equals one for years 2012 and beyond, zero otherwise. Affected is a dummy variable that equals one for treated banks that are subject to Regulation Y (with total asset greater than \$50 billion in fiscal year 2011), zero otherwise. See Table 1 for the definitions of control variables. All regressions are estimated using OLS. Standard errors clustered at bank level are reported in parentheses. *, **, and *** denote significance levels at 10%, 5%, and 1%, respectively.

Table 5: Confounding factors

Dependent variables:	ROE	ROE	ROE	ROE	ROE	ROE	ROE	ROE
	(1)	(2)	Volatility	Volatility	(5)	(7)	Volatility	Volatility
	(1)	(2)	(3)	(4)	(5)	(7)	(6)	(8)
Dividends*Post IRC*IRC	2.068 (1.385)		0.569 (0.405)					
Repurchases *Post IRC*IRC		3.385 (3.294)		-3.511 (3.757)				
Dividends*Post Y*Affected					3.057** (1.525)		-1.488* (0.770)	
Repurchases *Post Y*Affected						4.353 (3.571)		-4.109 (3.927)
Dividends*TARP Duration*TARP Bank					0.400 (0.733)		-0.574 (0.527)	
Repurchases *TARP Duration*TARP Bank						1.267** (0.530)		0.141 (0.484)
Lagged bank and market controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	7005	7005	6003	6003	7293	7293	6264	6264
No. of banks	1017	1017	914	914	1047	1047	944	944
Adjusted R-squared	0.02	0.02	0.10	0.10	0.02	0.02	0.01	0.01

Note: This table presents the results of confounding factor tests. Dependent variables are return on equity (ROE) and the volatility of return on equity (ROE Volatility). Dividends are measured using dividends paid to common shareholders deflated by the book value of equity capital. In columns 1 to 4, we test whether the establishment of independent risk committees on publicly listed banks with assets exceeding \$10 billion confounds our main results. In these tests, we restrict the sample to banks with less than \$50 billion of total assets and create two dummy variables: Post IRC equals to 1 for years 2011 and beyond and IRC equals to 1 for publicly listed banks with assets exceeding \$10 billion as of 2011. We then interact these variables with Payout as in Equation (1) and re-estimate the effects of independent risk committees on our main results. In columns 5 to 8, we test whether TARP capital injection confounds our results. To this end, we saturate Equation (1) with TARP Duration, TARP Bank and their interactions with Payout. Both TARP Duration and TARP Bank are binary variables, where the former equals one for those years a bank received tarp funding and the latter is equal to one for TARP participating banks. All regressions are estimated using Ordinary Least Squares. Lagged bank-specific and market control variables and contemporaneous macroeconomic indicator are included but not reported for brevity. See Table 1 for the definitions of these variables. Standard errors are clustered at bank level reported in parentheses. *, **, and *** denote significance level at 10%, 5%, and 1%, respectively.

Table 6: Placebo tests

Dependent variable: Payout measure:	ROE		ROE Volatility	
	Dividends	Repurchases	Dividends	Repurchases
	(1)	(2)	(3)	(4)
Payout	-0.404 (0.524)	4.394 (4.175)	-0.062 (0.241)	-6.497 (6.777)
Payout*Placebo Post Y	1.130** (0.569)	-3.969 (2.948)	-0.726* (0.400)	7.191 (7.611)
Payout *Affected	-0.113 (1.512)	-4.420 (3.959)	0.695 (0.584)	6.842 (6.563)
Placebo Post Y*Affected	17.151* (9.549)	15.132*** (5.644)	-5.749 (4.720)	-1.322 (3.553)
Payout *Placebo Post Y*Affected	-0.473 (1.827)	4.070 (2.732)	0.267 (0.725)	-7.402 (7.322)
Constant	422.645* (225.560)	239.576 (265.630)	-513.672*** (184.917)	-286.900*** (104.084)
Lagged bank and market controls	Yes	Yes	Yes	Yes
Macroeconomic control	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	4401	4401	4158	4158
No. of banks	895	895	838	838
Adjusted R-squared	0.02	0.02	0.03	0.02

Note: This table presents the results of placebo tests. We restrict the sample to years 2006 to 2011 and falsely assume that Regulation Y changed in 2008. Dependent variables are return on equity (ROE) and the volatility of return on equity (ROE Volatility). Dividends are measured using dividends paid to common shareholders deflated by the book value of equity capital. Repurchases are share repurchases to equity ratio. All regressions are estimated using Ordinary Least Squares. Lagged bank-specific and market control variables and contemporaneous macroeconomic indicator are included but not reported for brevity. See Table 1 for the definitions of these variables. Standard errors clustered at bank level are reported in parentheses. *, **, and *** denote significance level at 10%, 5%, and 1%, respectively.

Table 7: Sensitivity checks

Dependent variables:	ROE					ROE Volatility				
	Public listed bank sample	Above \$1 billion asset sample	Excluding banks with asset change	Dividend change	Dividend increase	Public listed bank sample	Above \$1 billion asset sample	Excluding banks with asset change	Dividend change	Dividend increase
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dividends	0.865 (1.260)	0.449 (0.423)	0.167 (0.304)	-0.289 (0.309)	2.422 (4.057)	0.904** (0.375)	0.030 (0.279)	0.153 (0.194)	0.003 (0.179)	-2.191 (2.707)
Dividends*Post Y	-1.618* (0.831)	-0.576** (0.289)	-0.193 (0.213)	0.217 (0.290)	-4.258 (3.604)	-0.794*** (0.230)	-0.611*** (0.212)	-0.670*** (0.201)	0.004 (0.201)	4.447 (2.771)
Dividends*Affected	-2.058* (1.151)	-3.027*** (0.974)	-2.624*** (0.784)	-6.416*** (1.848)	-27.673*** (7.560)	-0.090 (0.462)	0.729 (0.509)	0.744* (0.431)	1.517 (1.184)	9.129 (6.512)
Post Y*Affected	-26.549*** (9.916)	-24.564*** (7.575)	-19.782*** (6.356)	-5.083** (2.216)	-19.947*** (6.023)	-0.489 (1.420)	-1.830 (1.714)	-1.774 (1.617)	1.387 (1.614)	7.060*** (2.528)
Dividends*Post Y*Affected	5.786** (2.910)	4.220** (1.996)	3.430** (1.701)	4.665*** (1.800)	24.637*** (7.076)	0.411 (0.600)	-0.271 (0.606)	-0.365 (0.601)	-2.579* (1.415)	-10.446* (5.412)
Constant	187.149** (83.149)		213.948*** (50.924)	69.130 (106.805)	62.845 (107.689)	-91.353** (45.149)	-164.578** (70.536)	-192.360*** (68.884)	-302.493*** (63.864)	-294.859*** (62.854)
Lagged bank and market controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	3236	5497	7267	7287	7287	2750	4723	6243	6259	6259
No. of banks	502	792	1041	1046	1046	441	714	940	943	943
Adjusted R-squared	0.045	0.020	0.019	0.022	0.022	0.025	0.002	0.002	0.004	0.005

Note: This table presents the results of sensitivity tests. Dependent variables are return on equity (ROE) and the volatility of return on equity (ROE Volatility). In column 1, we restrict the sample to publicly traded banks while in column 2 we restrict the sample to banks above \$1 billion assets. In column 3, exclude banks that changed their asset size in the post-treatment period. In column 4, we measure the Dividend variable using dividend change calculated as the change of dividends from previous year divided by the lagged equity capital. In column 5, we use a dummy variable that equals one if banks increase their dividend payout ratio from the previous year, zero otherwise. We repeat the same regressions using ROE volatility in columns 6-10. All regressions are estimated using Ordinary Least Squares. Lagged bank-specific and market control variables and contemporaneous macroeconomic indicator are included but not reported for brevity. See Table 1 for the definitions of these variables. Standard errors are clustered at bank level reported in parentheses. *, **, and *** denote significance level at 10%, 5%, and 1%, respectively.



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