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## TARP's Dividend Skippers

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## TARP's Dividend Skippers

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## **TARP's Dividend Skippers**

Most of the banks receiving capital injections from the Troubled Asset Relief Program (TARP) issued preferred stock to taxpayers. This paper looks at the factors that affect publicly traded banks' ability to pay the scheduled TARP preferred stock dividends. Smaller banks with weaker capital ratios and more problem loans are significantly more likely to suspend payments of their bailout dividends.

*Journal of Economic Literature Codes:* G21, G28, G38

*Keywords:* bailout, banking, Capital Purchase Program, dividends, Emergency Economic Stabilization Act, hybrid securities, preferred stock, Small Business Lending Fund, trust preferred, TRUPS, TARP

## 1. Introduction

In response to the financial crisis of 2008, the government implemented the Troubled Asset Relief Program (TARP). Its largest program the Capital Purchase Program (CPP) purchased preferred stocks from U.S. bank holding companies. Preferred stocks (compared to common stocks) have received less attention in the academic literature. Yet, the issuance of preferred stock has grown in recent years. Prior to the crisis, there has been a shift in the composition of bank capital. Acharya *et al.* (2009) find that many banks had started to rely less on common equity and more on preferred shares. As preferred shares have become more widespread, it is important to study the preferred dividend payment behavior of banks issuing preferred shares.

Traditionally, dividend payout behavior has been explained by the expectation for future earnings. See Lintner (1956). Other explanations for common stock dividend payment behavior come from signaling theory, the clientele effect, and the tax benefits of capital gains versus dividends. See Brav *et al.* (2005). Denis and Osobov (2008) cast doubt on the current validity of the signaling and clientele explanations. In the banking literature, Onali (2009) finds that dividends are associated with a higher default risk, consistent with moral hazard behavior. Cornet *et al.* (2008) find that common stock dividends have a strong signaling content. In this paper, we investigate possible explanations for the decisions of publicly traded TARP recipient banks to pay or skip dividends on their bailout preferred shares.

We build a predictive model that identifies the determinants of the decision of TARP recipient to skip preferred dividend payments. This decision will be determined

by the size of banks (smaller size could imply less analyst coverage and potential agency problems), potential growth opportunities, capitalization, and overall financial performance. Our results suggest that the publicly traded banks missing Troubled Asset Relief Program (TARP) preferred stock dividends are significantly smaller, have weaker capital ratios, are less profitable. Dividend skippers also have lower market to book ratios than banks paying their scheduled dividends. In a multivariate logistic model, we show that higher non-performing asset ratios, smaller bank size, and lower tier 2 capital ratios are significant predictors of the failure to pay dividends. This paper may be of interest to academics, preferred stock investors, and government policy makers. When banks miss public dividends, or worse—fail, these missed dividends or failures are of national interest.<sup>1</sup> Moreover, never before has the U.S. had such a large issuance of preferred stock in a short period of time. This paper takes advantage of a unique opportunity to study what drives the performance of these government directed investments.

The government sector made huge preferred stock investments to stem the panic of 2008 and 2009. Dash (2009) put the size of the preferred stock market at \$193 billion in 2005. Yet, the U.S. Government's preferred stock investments in 2008 and 2009 easily eclipsed that. Most of the 707 banks that received \$205 billion of CPP funds were

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<sup>1</sup> See David Cho, June 14, 2010, "Small banks are big problem in government bailout program," *Washington Post*, accessed online on August 2, 2010, at <http://www.washingtonpost.com/wp-dyn/content/article/2010/06/13/AR2010061304513.html>; and Scott Olster, May 28, 2010, "TARP's Tiniest Failures Add Up," *CNNMoney.com*, accessed online on August 2, 2010, [http://money.cnn.com/2010/05/28/news/economy/tiny\\_tarp\\_failures.fortune/index.htm](http://money.cnn.com/2010/05/28/news/economy/tiny_tarp_failures.fortune/index.htm). New preferred stock investments through the TARP have been suspended after the passage of the Dodd-Frank Wall Street Reform Act of 2010. Yet, in July 2010, there is legislation which passed the U.S. House of Representatives and is pending in the Senate to make \$30 billion of new preferred stock investments in small banks with assets of less than \$10 billion. See Donna Smith, July 21, 2010, "FACTBOX-Wall St bill speeds TARP wind down," Reuters accessed online on August 2 2010, at <http://www.reuters.com/article/idUSN2115873120100721>; and July 30, 2010, "Son of TARP," *Wall Street Journal*, accessed online on August 2, 2010, at <http://online.wsj.com/article/SB10001424052748703578104575397270802770004.html>.

privately held, but the vast majority of the funds were invested in publicly held banks in exchange for senior preferred stock and warrants.<sup>2</sup> Indeed, the Congressional Oversight Panel (2010) points out that 81 percent of the monies in the Capital Purchase Program (CPP) were directed at 17 publicly traded banks with over \$100 billion in assets.

Preferred stock is a hybrid security with features of both debt and equity. It is junior to all kinds of debt in the capital structure and thus has relatively low recovery rates relative to debt. Yet, it is senior to common stock in bankruptcy. Keenan (2000) estimates that the average preferred stock recovery rates given default from 1970 to 1999 were about 11 percent of par compared to 49 percent of par for senior unsecured bonds. Yet, preferred stock tends to pay relatively stable and high dividends. Thus, it sometimes is attractive to more adventurous fixed income investors, who shun common stock. Preferred stock generally does not have voting rights, which makes it attractive to the government policy makers fearful of charges of “nationalization.”<sup>3</sup>

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<sup>2</sup> The Capital Purchase Program is the program most susceptible to empirical tests because of the large number of institutions participating in it. Nevertheless, the U.S. government’s total preferred stock investments among many different financial rescue programs starting in 2008 easily dwarfs private sector preferred stock outstanding in the United States. The government had a par value of \$13.9 billion of preferred stock in the auto lender GMAC LLC, now called Ally Financial, according to SIGTARP (2010, p. 42). Yet, those investments were made under the Automotive Industry Financing Program (AIFP) and much of that preferred stock was could be converted into common shares. In addition to \$50 billion of Capital Purchase Program monies invested in Bank of America and Citigroup, an additional \$40 billion was invested in exchange for further preferred stock and warrants as part of the Targeted Investment Program (TIP). Both Bank of America and Citigroup repaid those TIP preferred shares in December 2009, according to Wilson and Wu (2010b). The U.S. Government had commitments to buy \$69.8 billion in preferred stock in AIG, which has never made a TARP dividend. About \$47.5 billion of that \$68.8 billion commitment had been used by AIG by June 30, 2010. AIG also missed \$5.5 billion in TARP dividends, according to SIGTARP (2010, p. 40). ProPublica (accessed online on August 2, 2010, at <http://bailout.propublica.org/programs/10-preferred-stock-investments>) lists the U.S. Government’s preferred stock investments in the mortgage giants Fannie Mae and Freddie Mac at \$83.6 billion and \$61.3 billion, respectively. Those latter investments were not part of the TARP legislation. Thus, by the time of writing, the U.S. Treasury has received in less than two years preferred stock with a par value in excess of \$400 billion or over twice the market value of the preferred stocks outstanding in the U.S. in 2005, according to Dash (2009).

<sup>3</sup> See Paulson (2010, pp. 337-338), which discusses the U. S. Treasury’s deliberations in early October 2008 before the CPP was launched. The former Secretary of the U. S. Treasury, Henry Paulson, who launched the CPP wrote, “Buying common stock would strengthen capital ratios, but common shares

This paper is organized as follows: section 2 describes the existing literature, in section 3, we discuss our hypotheses and in section 4 we describe the sample creation. Next, in section 5, we introduce our empirical results. Finally, in section 6, we conclude our discussion.

## **2. Review of the Existing Literature**

Because preferred stock is a niche security, there have been relatively few academic studies looking at preferred stock prior to the financial crisis of 2008. Carty (1995) and Crabbe (1996) are the only academic studies that explore how skipping preferred stock dividends affects the prices of preferred shares. Carty (1995) finds that a month after a corporation skips its preferred stock dividend, its preferred stock trades for 40 percent of par on average. Crabbe (1996) uses dividend pass rates to estimate the appropriate yields of preferred stock for a risk neutral investor.

Most of the academic research on preferred stock has focused on questions of taxes and optimal capital structure. Bajaj *et al.* (2002) study over 3,000 new preferred stock issues from 1980 to 1999 and find that highly rated preferred shares are issued at lower yields than similarly rated bonds. They attribute this to the fact that preferred dividends are not tax deductible to issuers, but bond interest payments are. They find that this effect is reversed for junk-rated preferred stock issues. Thus yields are higher for junk-rated preferred shares than for junk-rated debt issues. This is likely due to the fact that the higher credit risks of preferred shares trump tax considerations. Pons-Sanz

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carried voting rights, and we wanted to avoid anything that looked like nationalization. So we were leaning toward preferred stock...”

*et al.* (2007) find that less profitable issuers favor preferred shares over debt because the lost tax deductions from not issuing debt are less valuable to those issuers. Yet, as the study by Engel *et al.* (1999) points out, a large class of preferred stock first issued in 1993, trust preferred, is tax deductible like debt. Moreover, from 1996 until the passage of the Dodd-Frank Wall Street Reform Act of 2010 it counted as the highest quality capital, tier 1, for U.S. banking regulations.<sup>4</sup> Harvey *et al.* (2003) found that the Federal Reserve's decision in 1996 to count TRUPS, trust-preferred shares, as tier 1 capital corresponded with positive and significant returns to the stock and bondholders in the banks affected by the decision.

Most of the academic research on the TARP has been focused on the questions of which banks entered the largest TARP program, the Capital Purchase Program (CPP). The Capital Purchase Program passed out \$205 billion from October 14, 2008, to December 29, 2009, to 707 different banks. Bayazitova and Shivdasani (2009), Duchin and Sosyura (2009), Taliaferro (2009), Cadman *et al.* (2010), Li (2010), Jordan *et al.* (2010), and Ng *et al.* (2010) are all examples of studies that look at the characteristics of banks that enter the CPP. Bayazitova and Shivdasani (2009), find that banks that accepted TARP had significantly lower tier 1 capital ratios than banks that rejected TARP or did not apply for TARP funds. Wilson and Wu (2010b) study the characteristic of banks that exit the CPP early. In contrast to the entry literature, the banks that exit TARP have significantly better capital ratios than the banks that are left in the program.

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<sup>4</sup> The Collins Amendment, which became law as part of the Dodd-Frank 2010 Act and is named after a U.S. senator from Maine—Susan Collins, mandated that banks with over \$15 billion in assets could not count TRUPS, trust-preferred securities, as tier 1 capital. See Jochelle Mendonca, July 21, 2010, “Fulton shares fall on Q2 miss, negative credit view,” *Reuters*, accessed online on August 2, 2010, at <http://www.reuters.com/article/idUSTRE66K43520100721>.



Another large strand of literature looks at the characteristics of whether or not the capital injections would give banks incentives to make more good loans. This literature attempts to address policy makers' concerns that TARP capital injections were used to increase credit and boost economic growth. The academic studies addressing the use of CPP preferred stock to make loans are Bebchuk and Goldstein (2008), Philippon and Schnabl (2009), Wilson (2009), Taliaferro (2009), Li (2010), and Wilson and Wu (2010a).

The event studies of Veronesi and Zingales (2010) and Kim and Stock (2010) investigate the effect of the preferred stock injections on the stock, bond, and preferred stock prices of the largest and earliest CPP recipients. Kim (2010) finds that banks' share prices suffered as stringent executive pay restrictions were enacted in the 2009 economic stimulus bill.

### **3. Hypotheses**

Our expectations for the determinants of the dividend skipping behavior of banks are based on the size, the level of capitalization, the profitability, and the previous dividend skipping behavior of TARP recipient banks.

Larger banks will find it easier to make quarterly dividend payments because they have greater access to capital markets and they are under more public scrutiny because of their more recognizable brands. Moreover, there is some evidence in Paulson (2010, pp. 362-266) that at least the original TARP recipients, which included the nation's six largest bank holding companies, were pressured to accept the funds. Thus, the U.S.

Treasury may have more adverse selection problems from smaller banks, seeking TARP funds than from larger banks which may have had little choice about entering the program. Therefore, our first hypothesis is the following:

*Hypothesis 1: Smaller banks are more likely to skip dividends.*

Better capitalized banks are more likely to pay dividends. Thus, we should expect that banks with higher core, tier 1, capital ratios and banks with higher supplementary capital ratios, tier 2 capital, should be more able to pay dividends. Poorly capitalized banks are often forced by regulators or financial necessity to suspend dividends. Tier 1 capital consists of common stock and some types of preferred stock. Tier 2 capital includes some types of preferred stock and subordinated debt. The Federal Reserve ruled that TARP preferred stock is classified as tier 1 capital for regulatory purposes.

*Hypothesis 2: Banks with lower capitalization are more likely to skip dividends.*

Return on assets is a scaled measure of bank profitability, which is independent of bank leverage. (That is why we did not use ROE, which depends directly on bank leverage, for the magnitude of the returns.) According to academic studies for non-banking firms, profitable firms are more likely to pay dividends. See Denis and Osobov (2008) and De Angelo *et al.* (2004). Similarly, we expect that more profitable banks are more able to pay dividends.

Stock investors are more forward looking than accounting statements. Thus, we should expect that forward looking stock investors are more likely to identify financial difficulties than backward looking financial records. This indicates that banks with higher market-to-book ratios should be less likely to skip TARP dividends.

A bank with more non-performing assets, such as nonaccrual loans, as percent of total assets will be under more pressure from regulators to cut its dividend. A high percentage of problem assets will scare away new private capital. Thus, a manager will likely be forced to suspend dividends if non-performing assets are too high. For this reason, a higher percentage of non-performing assets will make it more likely that a bank will suspend its dividend.

*Hypothesis 3: Banks with higher levels of non-performing assets will be more likely to skip dividends.*

A bank that has to pay cumulative dividends will be less likely to skip dividends because any missed dividends will have to be made up eventually. In contrast, a non-cumulative dividend issuer need not make up missed dividends. We should expect that the cumulative dividend dummy is negatively related to the propensity to skip dividends.

Carty (1995) shows that preferred stock dividend pass rates like defaults tend to increase over time. Thus, we should expect that the May 2009 and August 2009 observations are less likely to skip dividends. The observations in November 2009 and February 2010 are expected to be more likely to skip dividends. The elapse of time allows the worst performing banks' financials to deteriorate, leading to skipped

dividends. Further, Wilson and Wu (2010b) argue that banks exiting TARP are healthier than banks staying in TARP. Thus, a typical bank, which is still in TARP in the later quarters, should be less able to pay its bailout dividends.

*Hypothesis 4: Banks that miss the prior quarter's dividend are more likely to miss the next dividend. Banks that pay the prior quarter's dividend are more likely to pay the next dividend.*

Regulatory orders may specify that banks will suspend dividends. In addition, they may signal legal violations that may harm a bank's reputation with investors. Either situation will make it harder to maintain the preferred stock dividend. Thus, we expect a published regulatory order will be associated with missed TARP dividends.

#### **4. Data**

Our data consists of unbalanced panel of observations. Each bank in the sample has between one and five observations. Each observation is in reference to a TARP quarterly preferred stock dividend payment between May 2009 and May 2010. Banks entered the Capital Purchase Program between October 2008, when the program began, and December 2009, when the program closed to new investments. Banks exited the Capital Purchase Program between March 2009 through the end of the period studied. Banks that have entered but have not yet repaid the taxpayer investments in full are in the sample.

We tracked dividend payments from monthly dividend and interest reports issued by the Office of Financial Stability of the U.S. Treasury. We coded a missed dividend in a given month with a one, and coded a made dividend with a zero. The U.S. Treasury's dividend reports designate when a dividend is missed. (Dividend payments are usually due in the middle of the payment month.) If a bank was late on its dividend payment by a few days up to a couple weeks but made the full payment in the calendar month it was due, we coded that as a made payment for that month. SIGTARP (2009) and SIGTARP (2010) were used to identify the two banks that missed the first scheduled quarterly dividend payments in February 2009 since the U.S. Treasury's dividend and interest reports only go back to May 2009. We used the missed dividend dummy for May 2010, February 2010, November 2009, August 2009, and May 2009 as the dependent variable in the results in Tables 3 to 4. We dropped the February 2009 dividend history from the dependent variable because we looked at the last dividend payment as a predictor of future dividend payments in one specification in Table 3. Further, we broke up the sample based on prior dividend history in Table 4. Thus, we sacrificed one dividend cycle, February 2009, to have a lagged dividend payment variable. The February 2009 dividend history was only used to denote if a bank due to pay the May 2009 dividend had made its previous dividend payment.

The cumulative dividend dummy variable was also obtained from monthly dividend and interest reports. A small number of banks in the sample issued non-cumulative preferred stock to the U.S. Treasury. All TARP preferred stock is treated as tier 1 capital for regulatory purposes regardless of whether it is cumulative or non-cumulative.

Accounting data and capital ratios were obtained from Compustat's Bank Fundamentals Quarterly database. Size is measured by log of assets. When constructing the market-to-book ratio, we obtained the 2008 calendar year end stock prices from the CRSP database. Market-to-book is calculated as  $(\text{total assets} - \text{book equity} + \text{market value of equity}) / (\text{total assets})$ . Profitability (ROA) is defined as  $\text{EBIT} / (\text{total assets})$ .

The U.S. Treasury designates publicly traded banks as having received investments in exchange for preferred stock and warrants. Because this database is limited to publicly traded banks, we included only 280 publicly traded banks which agreed to pay quarterly dividends in February, May, August, and November. The list of publicly traded TARP banks was obtained from various transaction reports issued by the U.S. Treasury's Office of Financial Stability.

Publicly traded banks received investments in exchange for preferred stock and warrants. According to Wilson and Wu (2010b), these 282 banks received capital infusions of \$192 billion of the \$205 billion in the TARP's Capital Purchase Program (CPP). Thus, despite being a minority of the 707 banks receiving TARP funds, the publicly traded banks received the bulk of the investments. There are two of the 282 banks that issued preferred stock and warrants to taxpayers which pay their dividends in other months beside February, May, August, and November. We dropped these two banks from the sample. (Neither one of those large banks has missed a TARP dividend.) Those banks were the regional banks Sun Trust and Fifth Third Bank. When analyzing the propensity to miss dividends, we used the accounting statistics for the quarter just preceding the banks' quarterly dividend payment to the U.S. Treasury.

The regulatory order dummy variable was taken from a list of regulatory orders issued to all banks maintained by *Bailoutslueth.com*, which regularly reports on stories about bank failures and the Troubled Asset Relief Program (TARP).<sup>5</sup> This dummy variable equals one if a regulatory order was issued on or prior to the 15<sup>th</sup> of the month in which the quarterly dividend was due. The issuance of a published regulatory order can be for a variety of reasons. Usually a regulatory order is issued due to a capital deficiency or some other violation of laws or regulations by a bank or its employees. The accounting variables and regulatory order variables are data available to the public prior to the payment date of the TARP dividends.

The TARP preferred stock issued by all the banks in the sample pays a five percent annual dividend for the first five years and nine percent thereafter. Except for the first dividend and the dividends paid on exit, all the dividends in the sample were due in quarterly amounts of approximately 1.25 percent of the par value of the preferred shares. We are not aware of any instances where banks paid partial dividends. The banks either paid the full dividend due in the month it was due, or they did not pay any dividend at all.

**\*\*\*Insert Table 1 about here.\*\*\***

In Table 1, we present the summary statistics for the sample of 900 quarterly observations. Most of the observations, 91.8 percent, are of bank-quarters where the bank made its scheduled dividend.

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<sup>5</sup> See Ryan Holeywell, June 17, 2010, "TARP banks face rising regulatory issues -- at least one in nine has received federal enforcement action since getting public funds," *Bailoutslueth.com*, accessed online on August 3, 2010, at <http://bailoutslueth.com/10/06/710/more-than-one-out-of/>.

The sizes of the banks, as measured by total assets, are skewed, with a few huge banks and many smaller banks. The average bank size of \$22.7 billion is not even in the 90<sup>th</sup> percentile of the bank-quarter observations. The median bank-quarter observation has only \$1.8 billion in assets. 99 percent of banks owe cumulative preferred stock dividends to the U.S. Treasury. Very few bank-quarter observations, 4 percent, have missed a TARP dividend in the prior quarter. Moreover, very few bank-quarter observations, 5.9 percent, have been subject to a regulatory order.

## **5. Empirical Results**

In this section, we provide empirical tests of our hypotheses about which banks will be more likely to make their quarterly dividends. Large, profitable, better capitalized banks, which have not received regulatory reprimands, have fewer problem loans, and have issued cumulative preferred stocks, are less likely to skip TARP dividends. We also argue that later dividends are more likely to be skipped than earlier dividends. The univariate results in Table 2 generally bear out these predictions.

**\*\*\*Insert Table 2 about here.\*\*\***

In Table 2, we conduct t-tests to see if the variable means are significantly different when a bank-quarter observation misses a dividend versus the case when the TARP dividend is paid. The predicted relationships between skipped dividends and the other variables are correct for all variables except for the August 2009 dividend dummy



variable. Nevertheless, just over half of these variable means for dividend skippers are significantly different from the averages for dividend payers. Banks with lower total assets, lower returns on assets (ROA), lower tier 2 capital ratios, lower market-to-book ratios, and more non-performing assets are significantly more likely to skip dividends. Also banks that missed the previous quarter's dividend are significantly more likely to miss this quarter's dividend. Bank-quarter observations in May 2009 are significantly more likely to pay their dividends than observations in other quarters.

The magnitudes of these differences, which are highlighted in Table 2, are sometimes large. The average dividend payer has assets of \$24.5 billion compared to the average assets of a dividend skipper of \$2.3 billion. The non-performing assets as a percent of total assets are 1.5 percent higher for dividend skippers versus dividend payers. It is not unusual for banks to have common equity to total of assets of around 4.5 percent. Thus a 1.5 percent decline in the value of assets could wipe out a third of a bank's equity in such a situation.

The logistic regression, also known as the logit model, is used when the dependent variable takes on a value of zero or one. The coefficients estimated in the logit model can be used to make predicted probabilities. Gujarati (1995, p. 544) argues that linear models such as Ordinary Least Squares (OLS) are usually avoided in this situation because they can produce negative probabilities and probabilities greater than one. The OLS linear probability model can also create econometric problems related to violations of normality and serial correlation of the errors.

We use the logistic regression introduced by Cox (1970) to avoid these potential problems. The logistic model is based on the logistic distribution which produces fatter

tails than the normal distribution. Let us define  $p_i$  as the probability that a bank-quarter observation will skip its dividend. This is denoted by the dependent variable,  $Y$ , taking on the value 1. Suppose that  $\mathbf{x}_i$  is a row vector of independent variables of the  $i$ -th observation in our sample. Let  $\beta$  be a column vector of the coefficients estimated from the model. Thus, Johnston and Dinardo (1997, p. 424) argues the probability of the dependent variable equaling one if the distribution of outcomes is logistic is the following:

$$p_i = E(Y = 1 | \mathbf{x}_i) = \frac{e^{\mathbf{x}_i \beta}}{1 + e^{\mathbf{x}_i \beta}} \quad (1)$$

It can be shown that the log odds ratio is equal to

$$\ln \left( \frac{p_i}{1 - p_i} \right) = \mathbf{x}_i \beta. \quad (2)$$

Thus, the log odds ratio is linear. The logit model is estimated using maximum likelihood estimation.

In this section, we study the propensity of publicly traded TARP recipient banks to skip preferred dividend payments. Based on our expectations outlined in the hypotheses section we test the following model:

*Probability of skipping dividends = f[size, profitability, market-to-book, capitalization, non-performing assets, previous dividend skipping dummy (for each quarter), regulatory order dummy]*

Let us proceed with several specifications of the above logistic model. In Tables 3 and 4, we attempt to predict a bank's likelihood of missing the TARP dividend in a given quarter.

**\*\*\*Insert Table 3 about here.\*\*\***

In Table 3, we present the results of the propensity of publicly traded TARP recipient bank to skip dividends. To measure the impact of bank size we use log of assets, similar to Gropp and Heider (2010). In Model 1 of Table 3, we include the accounting variables and the cumulative dividend dummy. The results suggest that smaller banks are more likely to miss dividends, consistent with *Hypothesis 1* and that banks with a greater percent of non-performing assets are significantly more likely to miss a dividend, consistent with our *Hypothesis 3*. The tier 2 capital ratio is significantly negatively related to missing a dividend. The tier 2 capital ratio, even more than the tier 1 capital ratio, may be a good signal of a banks ability to tap capital markets, consistent with our *Hypothesis 2*. We looked for the banks that had publicly traded preferred stock or subordinated debt on the FINRA market data site. Most of the banks in our sample had less than \$10 billion in assets, according to Table 1. Of the banks issuing preferred stock and warrants in exchange for TARP funds with under \$10 billion in assets in 2008,

there were only four banks with preferred stock or subordinated debt that had been traded within the last month when we searched. Thus, the tier 2 capital ratio may be a proxy for the ability to tap capital markets even more than the core capital ratio. Banks with few opportunities to raise capital will be much more likely to suspend dividends to conserve capital.

In Model 2 of Table 3, we add a dummy variable indicating whether banks missed prior dividends. The prior missed dividend dummy variable was positive and significant, consistent with our *Hypothesis 4*. Nevertheless, that variable is a lagged dependent variable. Since the standard issues associated with time series models are not easily addressed in logit models or models containing independent variables, the results in Model 2 should be treated with some caution.

In Model 3 of Table 3, we add quarterly dummy variables to study the dividend skipping behavior based on prior months' dividend behavior. The tier 1 capital ratio was negative and significant as predicted when the quarterly dummy variables were added. Further, as the t-tests in Table 2 show, the May 2009 quarterly dummy variable was negative and significant. That indicates that bank-quarter observations in May 2009 were significantly less likely to miss TARP dividends relative to the other quarters studied—August 2009, November 2009, February 2010, and May 2010. In Model 4 of Table 3, we add regulatory order dummy variable. The rest of the variables of interest maintain their significance, and we find some evidence that a regulatory order will be associated with an increased propensity of dividend skipping.

**\*\*\*Insert Table 4 about here.\*\*\***

Because missing the previous quarter's dividend is a strong predictor of a bank's missing the present quarter's dividend, we have split the sample in two based on previous dividend skipping behavior and the results are presented in Table 4. The log odds of missing a dividend in Models 1 and 3 of Table 4 are conditional on the bank-observation not missing its TARP dividend in the prior quarter. Likewise, the log odds of the bank-quarter observation missing a TARP dividend in Models 2 and 4 are conditional on the bank-quarter observation missing the prior quarter's dividend. In this way, we avoid putting a lagged dependent variable in the regression as in Model 2 of Table 3, but we address the impact of a prior missed dividend on the probability that a bank will continue to miss its TARP dividends.

In Models 1 and 2 of Table 4 we study the determinants of the propensity of banks to skip dividends using all of the independent variables from Table 3. Model 1 suggests that a bank's size is significantly negatively related to skipping a dividend for banks that did not miss their prior dividend, consistent with our *Hypothesis 1*. Yet, the log of total assets is not significant for banks that missed their last dividend. Thus, if a big bank misses a dividend, it is probably just as likely to miss the next dividend as a small bank. Model 1 also suggests that a higher tier 2 capital ratio makes a bank significantly less likely to miss a dividend, given that they did not miss their prior dividend. Model 2 of Table 4 suggests that there is no significant relationship between the tier 2 ratio for banks that missed their prior TARP dividend. The non-performing assets ratio is still significant and positively related to skipping dividend in Model 1 of Table 4. Model 1 also suggests that the only quarterly dividend dummy variable that

impacts the propensity of banks to skip dividends is the August 2009 dividend dummy and the May 2009 dummy is not significant anymore.

Model 2 of Table 4 shows the results for banks which missed prior dividends. The larger part of the sample (864 observations) is based on the bank-quarter observations where no previous dividend was skipped. There are only 36 bank-quarter observations where a prior dividend was missed. This lack of observations probably leads to the lack of significance in Model 2 which has 12 independent variables. Yet, it generates the highest pseudo R-squared by far of 74 percent.

In Models 3 and 4 we drop the quarterly dummies and the regulatory order dummy. The results suggest that both size and ROA significantly increase the propensity of banks to skip dividends when banks skipped prior dividends and non-performing assets significant increase the dividend skipping behavior for both banks that missed and did not miss prior dividends.

In Model 4, the pseudo R-squared goes down as the quarterly dummies and the regulatory order dummies are dropped. Interestingly, a higher return on assets is associated with a higher likelihood of missing a dividend in Model 4, contrary to the predicted sign and the t-test results in Table 2. It is not clear why this would be the case. Indeed, given that a bank did not miss its prior TARP dividend, in Model 3, a higher return on assets makes a bank significantly less likely to miss a TARP dividend.

Finally, non-performing asset ratios are still significant and positively related to skipping dividends, according to Models 1, 3, and 4 in Table 4. In Model 4, the coefficient is much larger than the coefficient in Model 3. Thus our results suggest that

non-performing asset ratios may become more important for prior dividend skippers than for banks which did not skip dividends in Model 3.

## **6. Conclusion**

This is the first study to rigorously test factors that lead firms to skip preferred stock dividends. Moreover, it is the first empirical study to look at the characteristics of banks that skip preferred stock dividends from the Troubled Asset Relief Program (TARP). As Carty (1995) documents, missed preferred stock dividends usually coincided with a preferred stock that traded far below par. Thus, missed preferred stock dividends are economically meaningful, and may be an early warning sign of financial distress. Smaller banks, banks with lower tier 2 capital ratios, and banks with more problem assets are likely candidates to skip their TARP dividends. Since pending legislation proposes to inject \$30 billion more preferred stock into small banks with less than \$10 billion in assets,<sup>6</sup> the current study lends support to the notion that that program may be a very risky proposition.

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<sup>6</sup> See Daniel Wagner, August 1, 2010, "Program risks \$30B to save weak banks," Associated Press, accessed online on August 2, 2010, at [http://www.forbes.com/feeds/ap/2010/08/01/general-us-bank-bailouts\\_7814915.html](http://www.forbes.com/feeds/ap/2010/08/01/general-us-bank-bailouts_7814915.html).

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**Table 1: Summary statistics**

The total sample had 900 observations. The missed quarterly dividend dummy equals 1 if the bank missed the most recent quarterly dividend, and it equals 0 if the bank made the most recent quarterly dividend. The cumulative dividend dummy equals 1 if the dividend is cumulative, and it equals 0 if the dividend is noncumulative. The missed prior dividend dummy equals 1 if the bank missed the previous quarter's dividend, and 0 means that it has not. The May 2009 dividend dummy equals 1 if the dependent variable refers to the May 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The August 2009 dividend dummy equals 1 if the dependent variable refers to the August 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The November 2009 dividend dummy equals 1 if the dependent variable refers to the November 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The February 2010 dividend dummy equals 1 if the dependent variable refers to the February 2010 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The regulatory order dummy equals 1 if a regulatory order was issued to this company prior to the dividend date, and it equals 0 if no regulatory order has been issued by the dividend date.

<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>	<b>10th Percentile</b>	<b>90th Percentile</b>	<b>Standard Deviation</b>
Missed Quarterly Dividend Dummy	0.0822	0	0	1	0	0	0.275
Total Assets in Millions	\$22,696	\$1,774	\$223	\$2,321,963	\$577	\$14,073	\$166,567
Return on Assets (ROA)	-0.22%	0.03%	-7.16%	3.11%	-0.72%	0.20%	0.83%
Tier 1 Capital Ratio	11.724	11.830	0.220	20.890	8.785	14.415	2.410
Tier 2 Capital Ratio	2.092	1.300	-0.140	8.760	1.200	4.095	1.286
Market-to-Book Ratio	0.989	0.981	0.900	1.265	0.947	1.042	0.041
Non-performing Assets Divided by Total Assets	0.032	0.027	0.000	0.134	0.010	0.061	0.021
Cumulative Dividend Dummy	0.990	1	0	1	1	1	0.100
Missed Prior Dividend Dummy	0.040	0	0	1	0	0	0.196
May 2009 Dummy	0.238	0	0	1	0	1	0.426
August 2009 Dummy	0.223	0	0	1	0	1	0.417
November 2009 Dummy	0.214	0	0	1	0	1	0.411
February 2010 Dummy	0.209	0	0	1	0	1	0.407
Regulatory Order Dummy	0.059	0	0	1	0	0	0.236

**Table 2: T-tests of means for dividend skipping and non skipping banks**

Coefficients that are statistically significant at greater than the 10 percent level are in bold italics. The cumulative dividend dummy equals 1 if the dividend is cumulative, and it equals 0 if the dividend is noncumulative. The missed prior dividend dummy equals 1 if the bank missed the previous quarter's dividend, and 0 means that it has not. The May 2009 dividend dummy equals 1 if the dependent variable refers to the May 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The August 2009 dividend dummy equals 1 if the dependent variable refers to the August 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The November 2009 dividend dummy equals 1 if the dependent variable refers to the November 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The February 2010 dividend dummy equals 1 if the dependent variable refers to the February 2010 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The regulatory order dummy equals 1 if a regulatory order was issued to this company prior to the dividend date, and it equals 0 if no regulatory order has been issued by the dividend date.

Grouping Variable Value	1	0	Difference of Means (1) - (0)	1	0	T-test's P-value	Predicted Difference (1) - (0)
Variable	Mean			Standard Error			
Total Assets in Millions	<i>\$2,266</i>	<i>\$24,527</i>	<i>-\$22,261</i>	<i>\$3,164</i>	<i>\$173,757</i>	<i>0.000</i>	-
Return on Assets (ROA)	<i>-0.58%</i>	<i>-0.19%</i>	<i>-0.39%</i>	<i>1.17%</i>	<i>0.78%</i>	<i>0.007</i>	-
Tier 1 Capital Ratio	10.863	11.801	-0.939	2.195	2.415	0.182	-
Tier 2 Capital Ratio	<i>1.901</i>	<i>2.109</i>	<i>-0.208</i>	<i>1.287</i>	<i>1.286</i>	<i>0.000</i>	-
Market-to-Book Ratio	<i>0.972</i>	<i>0.990</i>	<i>-0.018</i>	<i>0.033</i>	<i>0.041</i>	<i>0.001</i>	-
Non-performing Assets Divided by Total Assets	<i>0.046</i>	<i>0.031</i>	<i>0.015</i>	<i>0.029</i>	<i>0.019</i>	<i>0.000</i>	+
Cumulative Dividend Dummy	0.986	0.990	-0.004	0.116	0.098	0.784	-
Regulatory Order Dummy	0.108	0.054	0.054	0.313	0.227	0.153	+
Missed Prior Dividend Dummy	<i>0.189</i>	<i>0.027</i>	<i>0.163</i>	<i>0.394</i>	<i>0.161</i>	<i>0.000</i>	+
May 2009 Dummy	<i>0.068</i>	<i>0.253</i>	<i>-0.185</i>	<i>0.253</i>	<i>0.435</i>	<i>0.000</i>	-
August 2009 Dummy	0.257	0.220	0.036	0.440	0.415	0.472	-
November 2009 Dummy	0.230	0.213	0.017	0.424	0.410	0.746	+
February 2010 Dummy	0.257	0.205	0.052	0.440	0.404	0.291	+
<b>Number of Observations</b>	<b>74</b>	<b>826</b>		<b>74</b>	<b>826</b>		

**Table 3: Logistic regression on the propensity to skip dividends**

The dependent variable in the logistic regression equals 1 if the bank missed that quarter's Troubled Asset Relief Program (TARP) dividend, and it equals 0 if the bank made its TARP quarterly dividend. Coefficients that are statistically significant at greater than the 10 percent level are in bold italics. The cumulative dividend dummy equals 1 if the dividend is cumulative, and it equals 0 if the dividend is noncumulative. The missed prior dividend dummy equals 1 if the bank missed the previous quarter's dividend, and 0 means that it has not. The May 2009 dividend dummy equals 1 if the dependent variable refers to the May 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The August 2009 dividend dummy equals 1 if the dependent variable refers to the August 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The November 2009 dividend dummy equals 1 if the dependent variable refers to the November 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The February 2010 dividend dummy equals 1 if the dependent variable refers to the February 2010 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The regulatory order dummy equals 1 if a regulatory order was issued to this company prior to the dividend date, and it equals 0 if no regulatory order has been issued by the dividend date.

Intercept and Independent Variables	Model 1		Model 2		Model 3		Model 4		Predicted Sign
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value	
Intercept	6.2227	0.1561	5.0554	0.2548	7.6496	0.0867	<b>7.7630</b>	<b>0.0815</b>	none
Return on Assets	-9.2410	0.4821	-0.8646	0.9516	-10.0974	0.4470	-9.8635	0.4611	-
Log Assets	<b>-0.4569</b>	<b>0.0009</b>	<b>-0.5523</b>	<b>0.0002</b>	<b>-0.4669</b>	<b>0.0008</b>	<b>-0.4878</b>	<b>0.0006</b>	-
Tier 1 Capital Ratio	-0.0997	0.1266	-0.0672	0.3080	<b>-0.1111</b>	<b>0.0880</b>	<b>-0.1036</b>	<b>0.1150</b>	-
Tier 2 Capital Ratio	<b>-0.2592</b>	<b>0.0368</b>	-0.2030	0.1077	<b>-0.2567</b>	<b>0.0390</b>	<b>-0.2557</b>	<b>0.0392</b>	-
Market-to-Book Ratio	-4.4164	0.3151	-3.9555	0.3748	-4.7859	0.2807	-4.8742	0.2710	-
Non-Performing Assets Divided by Total Assets	<b>24.0822</b>	<b>&lt;.0001</b>	<b>19.4546</b>	<b>0.0019</b>	<b>19.9616</b>	<b>0.0019</b>	<b>19.1268</b>	<b>0.0033</b>	+
Cumulative Dividend Dummy	-0.1770	0.8804	0.8390	0.4936	-0.3371	0.7787	-0.3266	0.7848	-
Missed Prior Dividend Dummy			<b>1.6050</b>	<b>0.0006</b>					+
May 2009 Dividend Dummy					<b>-1.6150</b>	<b>0.0042</b>	<b>-1.5682</b>	<b>0.0058</b>	-
August 2009 Dividend Dummy					-0.3257	0.4291	-0.2848	0.4931	-
November 2009 Dividend Dummy					-0.4485	0.2745	-0.4081	0.3243	+
February 2010 Dividend Dummy					-0.6061	0.1429	-0.5848	0.1591	+
Regulatory Order Dummy							0.4275	0.3786	+
<b>Pseudo R-squared</b>	<b>0.0651</b>		<b>0.0765</b>		<b>0.0765</b>		<b>0.0773</b>		
<b>Number of Observations</b>	<b>900</b>		<b>900</b>		<b>900</b>		<b>900</b>		

**Table 4: Logistic regression on the propensity to skip dividends based on the split sample**

The dependent variable in the logistic regression equals 1 if the bank missed that quarter's Troubled Asset Relief Program (TARP) dividend, and it equals 0 if the bank made its TARP quarterly dividend. Coefficients that are statistically significant at greater than the 10 percent level are in bold italics. The sample is broken up into the 864 observations where the bank made its previous quarterly dividend and into 36 observations where it missed its previous quarterly dividend. The cumulative dividend dummy equals 1 if the dividend is cumulative, and it equals 0 if the dividend is noncumulative. The May 2009 dividend dummy equals 1 if the dependent variable refers to the May 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The August 2009 dividend dummy equals 1 if the dependent variable refers to the August 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The November 2009 dividend dummy equals 1 if the dependent variable refers to the November 2009 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The February 2010 dividend dummy equals 1 if the dependent variable refers to the February 2010 dividend, and it equals 0 if the dependent variable refers to another quarterly dividend. The regulatory order dummy equals 1 if a regulatory order was issued to this company prior to the dividend date, and it equals 0 if no regulatory order has been issued by the dividend date.

Parameter	Model 1		Model 2		Model 3		Model 4		Predicted Sign
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value	
Intercept	-8.0661	0.9919	88.6977	0.9304	-7.8801	0.9921	19.8728	0.2593	none
Return on Assets	-17.6038	0.2398	-8.0671	0.9942	<b><i>-24.3924</i></b>	<b><i>0.0959</i></b>	<b><i>99.3473</i></b>	<b><i>0.0334</i></b>	-
Log Assets	<b><i>-0.6332</i></b>	<b><i>0.0002</i></b>	-0.7241	0.9800	<b><i>-0.6313</i></b>	<b><i>0.0002</i></b>	0.7311	0.2433	-
Tier 1 Capital Ratio	-0.0957	0.2214	0.3495	0.9808	-0.0948	0.2159	0.0928	0.6302	-
Tier 2 Capital Ratio	<b><i>-0.2744</i></b>	<b><i>0.0568</i></b>	5.3148	0.8333	<b><i>-0.2698</i></b>	<b><i>0.0575</i></b>	0.5608	0.2855	-
Market-to-Book Ratio	-2.7317	0.5588	-80.9409	0.9353	-2.2545	0.6262	-27.1053	0.1359	-
Non-Performing Assets Divided by Total Assets	<b><i>14.1932</i></b>	<b><i>0.0592</i></b>	10.4896	0.9916	<b><i>15.9556</i></b>	<b><i>0.0240</i></b>	<b><i>48.1431</i></b>	<b><i>0.0365</i></b>	+
Cumulative Dividend Dummy	13.215	0.9868	-5.7126	0.9709	13.1698	0.9869	-3.9605	0.1197	-
May 2009 Dividend Dummy	-0.4768	0.5382	-5.7934	0.9708					-
August 2009 Dividend Dummy	<b><i>1.0806</i></b>	<b><i>0.0846</i></b>	-23.271	0.8135					-
November 2009 Dividend Dummy	1.0214	0.1029	-30.4922	0.6558					+
February 2010 Dividend Dummy	0.8867	0.1625	-18.6303	0.6885					+
Regulatory Order Dummy	0.1604	0.8090	0.7845	0.9890					+
<b>Pseudo R-squared</b>	0.0687		0.7371		0.0539		0.3505		
<b>Number of Observations</b>	864		36		864		36		