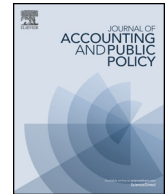




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Full length article

The implications of TARP: Evidence from bank performance and CEO pension benefits<sup>☆</sup>Emeka Nwaeze<sup>a</sup>, Qiao Xu<sup>b</sup>, Qin Jennifer Yin<sup>a,\*</sup><sup>a</sup> Department of Accounting, University of Texas at San Antonio, San Antonio, TX 78249, United States<sup>b</sup> School of Business Administration, University of Houston-Victoria, Victoria, TX 77901, United States

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## ABSTRACT

This study examines the effect of compensation restrictions introduced by the Troubled Assets Relief Program (TARP) of 2008 on the performance of banks and their compensation structures. It documents significant performance improvement among TARP banks that experienced Chief Executive Officer (CEO) resignations after their banks accepted TARP funds. The improvement is most significant in the year following CEO resignation. In addition, TARP banks that kept their CEOs show a significant increase in CEO pensions post-TARP. TARP banks that did not experience CEO resignations, thus, appear to substitute pension increases for their CEOs to mitigate the TARP-induced decrease in conventional forms of compensation. Further analysis on all banks without CEO resignations shows that TARP banks have significantly higher increase in pension benefits post 2009 than banks that chose to decline TARP funds. The evidence shows that increased pension arrangements play a significant role in CEOs' decisions to remain in their roles despite the constraints imposed by TARP.

## 1. Introduction

In response to the economic crisis in 2008, the US Treasury implemented the Troubled Asset Relief Program (TARP) to strengthen the financial system by purchasing troubled assets from financial institutions. One of the controversial aspects of the program is the restrictions it placed on executive compensation and actions deemed to impose excessive risks on the banks. Empirically, many studies show that some banks rejected TARP or exited TARP early due to the restrictions on the chief executive officer (CEO) compensation (e.g., Bayazitova and Shivdasani, 2012). Cadman et al. (2012) and Cazier (2014) find greater subsequent executive departures in banks that accepted TARP funds, and show that the departures were primarily voluntary. Based on Cadman et al. (2012), 81% of the executives who resigned moved to non-TARP banks. Kim (2010) reports a negative market reaction to the announcement of compensation restrictions for banks that accepted TARP. The adverse market reaction points to possible negative effect of the TARP on the long-run value of the banks. However, it is not clear whether resignations of some of the bank CEOs influenced the subsequent performance of their banks. Moreover, many of the bank CEOs did not resign despite the effect of TARP on their compensation; and, it is not clear why they chose to stay.

A key question that emerges from the preceding discussion is whether TARP banks whose CEOs resigned at the outset of the program experienced subsequent improvement or deterioration in performance. From an agency perspective, the bank CEO would

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resign because the personal costs of supplying effort would exceed the expected benefits (Cadman et al., 2012).<sup>1</sup> Such a resignation can harm productivity – the CEO departure can disrupt the decision process and cause productivity to decline. Relatedly, the TARP pay structure may fail to attract a new CEO that matches the outgoing one in skills and cause the bank to experience lower overall performance. Alternatively, the resignation can confer benefits to the bank. For example, productivity may rise to the extent that the bank can contract more efficiently and reduce agency costs; the bank can obtain benefits equal to or greater than the avoided agency costs associated with the outgoing CEO. Nonetheless, whether such resignations indeed resulted in performance improvement or performance decline is an empirical question.

A related question is potential explanations to the decision made by some CEOs to remain in their positions despite the TARP restrictions on their pay. One view is that such CEOs had an opportunity to balance out the pay shortfall through other arrangements. A potential avenue for such arrangements is through pension plans. In particular, the controlling TARP regulations do not prohibit the use of pensions in the CEOs' compensation.<sup>2</sup> The absence of explicit restrictions in the use of pensions creates an opportunity for the banks to use pension arrangements to mitigate the shortfall in executive pay arising from participation in TARP. Edmans and Liu (2011) discuss the benefits of pension plans in contracts, noting that such devices are cheaper and superior to bonuses in mitigating agency costs (see, also, Gerakos, 2010b; Scholes et al., 2002).<sup>3</sup> In our study, we focus on the level and changes in the CEO's pension benefits attributable to the defined benefit plan. As we describe in Section 2.2.2, defined benefit plans have several features (e.g., non-transportability across jobs, age requirement, and tax benefits) that banks can exploit to mitigate the incentive problem created by the TARP restrictions. Thus, incentives exist for such banks to substitute toward pensions. Therefore, banks that did not experience CEO resignations after accepting TARP should show abnormal shifts in pension benefits for their CEOs.

Using a sample of 259 public banks that accepted TARP funds, we test whether CEO resignations among these banks are associated with subsequent firm performance. For the test, we first separate the full sample into *ceo\_resign* and *ceo\_stay* banks. The *ceo\_resign* banks experienced CEO resignations during the TARP period. The *ceo\_stay* banks had no CEO resignation during the TARP period. Next, we perform a difference-in-difference analysis to mitigate the effects of factors that are unrelated to the CEO resignation. Based on the test, both *ceo\_resign* and *ceo\_stay* banks experienced performance improvements in the post-TARP period, but *ceo\_resign* banks had significantly higher performance improvement. These results hold after controlling for a variety of factors previously shown to affect firm performance.

The pension analysis shows a markedly higher increase in pension benefits for the CEOs of *ceo\_stay* banks compared with those of *ceo\_resign* banks. We also find that the increase in pension benefits is significantly higher for CEOs of TARP banks compared to that for CEOs of non-participating TARP banks. The marked increase in pension benefits for CEOs of *ceo\_stay* banks points to a strategy by the banks to alleviate the loss of conventional wages imposed by TARP. In an extended analysis, we also show that changes in pension benefits are positively and significantly associated with the likelihood that the CEO of a TARP bank stayed. We further find a significant increase in supplemental pension benefits in the post-TARP period for the *ceo\_stay* banks, but a decline in the level of such benefits in the post-TARP period for the *ceo\_resign* banks. These latter results provide support for the notion that pension arrangements influenced the decision by some CEOs to stay with their banks, despite the TARP pay restrictions.

This study contributes to the literature on the effect of regulatory intervention on firm performance and executive compensation. In particular, it focuses on the financial performance of TARP recipients whose CEOs resigned versus TARP recipients whose CEOs stayed. The results show significant improvements in performance among the TARP banks whose CEOs resigned, contrary to the concerns expressed in the financial press that TARP would harm bank performance. In addition, we find that bank CEOs did not resign in droves as anticipated; rather, there was a marked increase in pension benefits for the CEOs that stayed. We view the finding as evidence that those TARP banks that retained their CEOs substituted towards greater pension benefits to mitigate the adverse effects of TARP on the CEOs' annual compensation. Such an arrangement may explain the relatively modest CEO turnover among the banks that participated in the TARP. We also note that this study is the first that looks beyond the traditional forms of compensation during TARP and highlights how regulatory actions can have important consequences for organization performance and executive compensation.

The remainder of the paper is organized as follows. Section 2 discusses TARP's pay restrictions and develops the hypotheses. Section 3 describes our sample selection and the research design. Section 4 presents the results of our analyses and Section 5 concludes.

## 2. Background and hypotheses development

### 2.1. The background of TARP's executive compensation restrictions

In response to the financial crisis in 2008, the U.S. Congress enacted TARP on October 3, 2008 to give the US Treasury Department the authority to use up to \$700 billion for purchasing troubled assets and making equity infusions in financial institutions in an attempt to strengthen the financial system. The TARP restrictions on executive compensation applied to the CEO, CFO, and the next

<sup>1</sup> Studies in organization science also suggest that, when faced with conditions that could pose risk to their reputation or stigmatize their job status, executives have a tendency to jump ship, especially when the perceived risk of failure is high (Semadeni et al., 2008; Jiang et al., 2017).

<sup>2</sup> Code of Federal Regulations, TARP standards for compensation and corporate governance, title 31, sec. 30.

<sup>3</sup> Many argue that pension plans permit rent extraction because plan details are opaque which, in turn, allows CEOs to skim the pay-setting process (see, e.g., Bebchuk et al., 2002; Kalyta and Magnan, 2008).

three most highly paid executive officers in firms that receive funding under the Emergency Economic Stabilization Act (EESA).<sup>4</sup> Part of the restrictions limits the tax deductibility of compensation for the senior executives to \$500,000, reduces golden parachutes, and requires banks to claw-back bonuses. On February 17, 2009, the compensation restrictions were modified further to prohibit bonuses, retention awards, or incentive compensation exclusive of restricted stocks in amounts less than one-third of annual compensation. The pay restrictions applied retroactively to all TARP recipients, regardless of when they received the TARP funds.

Not all publicly-traded banks participated in TARP. Some banks turned down the TARP funds, arguing that participation would not be in the best interests of their shareholders. For example, Dick Evans, the CEO of Cullen/Frost Bankers, said “not participating in TARP... gave us the ability to stay focused on customers. We were able to keep building the company and not be distracted by the government.”<sup>5</sup> Many TARP recipients also expressed concerns that the pay restrictions intruded into their contracting process and could impair their ability to remain competitive in the executive labor market (Mooney and Jaffe, 2009). What is not obvious is whether and the extent that participation is associated with performance improvement or decline. It is also unclear why some CEOs of the participating banks stayed, while others resigned.

## 2.2. Hypotheses development

### 2.2.1. TARP-induced resignations and firm performance

Concerns exist about the effect of TARP on the financial performance and compensation structure, especially among the banks whose CEOs resigned after their banks received the TARP funds. One view is that CEO resignations are a direct response to the TARP arrangements that not only increased scrutiny and monitoring of the participating banks but also set pay levels below an acceptable threshold. In addition, the program failed to provide adequate incentive for actions needed to bring the banks out of the existing distress. In a preview of such an outcome, Scott Talbott, a senior executive of government affairs at the Financial Services Roundtable organized by NBC, predicted that bank executives would resign because they would not work for less than what they believed they were worth (Mooney and Jaffe, 2009). A key point in that view is that TARP-induced resignations by bank CEOs are responses to compensation structures that yield benefits below their reservation wages.

Of particular interest in this study is the impact of such resignations on the banks' profit performance. An outcome commonly touted by critics of the program is that top executives of the TARP recipients are likely to resign due to the restrictions that the program imposed on their behavior and compensation, and that their resignation would affect productivity. CEO departure would be disruptive and costly to the bank (see, Allgood and Farrell, 2003; Kesner and Sebor, 1994, for a narrative on the pervasive effect of CEO turnover). The immediate effects may include loss of a key talent, increased uncertainty about strategy, and general uneasiness among key staff. The bank must also fill the rank and role of the departing CEO and, in doing so, must construct new compensation contracts within the TARP rules. In other words, the new CEO must accept lower pay and effort incentives than his/her predecessor. If, as a result, the new CEO supplies less effort (i.e., effort level that is commensurate with the TARP-based compensation contract), then one can expect lower subsequent bank performance.

On the other hand, the CEO of a TARP recipient bank may resign because the program severely curtails the CEO's ability to skim the pay-setting process. For such CEOs, the disutility and personal costs from the loss of prerogatives to make certain decisions and limited opportunity to skim the pay-setting process may be prohibitive. Under this view, the CEO's departure can generate benefits for the TARP bank. The bank may obtain productivity gains via improvements in contract efficiency, and may reduce agency costs through the TARP monitoring arrangements. It can obtain additional economic gains equal to the avoided agency costs associated with the departing CEO. To the extent that these outcomes characterize the TARP recipient banks whose CEOs resigned, one would observe improvements in the performance of the banks after the resignations, all else being equal. The formal hypothesis is:

**H1.** TARP fund recipients whose CEOs exited after TARP would experience a change in performance in subsequent periods.

### 2.2.2. The impact of TARP on compensation structure: pension

We also explore potential incentives for some CEOs to remain with their banks despite the TARP rules. The CEO of a TARP bank may accept a pay cut in the short-term if he/she expects to balance out the shortfall via other arrangements. One potential channel through which the CEO can realize such outcome is pension plan. Under TARP, participation of executives in broad-based, tax-qualified retirement and welfare plans is deemed to meet the public interest standard and, thus, does not count toward the TARP limit on total annual compensation. For non-qualified plans, banks are not precluded from recognizing age and service credit for the purpose of vesting in accrued benefits. The interim final TARP rule, *TARP Standard for Compensation and Corporate Governance*, explicitly excludes actuarial increases in pension plans from the amount that determines an officer's annual total compensation (U.S. National Archives and Records Administration, 2009). In addition, pension accumulation has limited disclosure requirements, and is affected by actuarial estimates (mortality rate, inflation, rate of returns on assets, etc.) over which the firm has considerable discretion (Bebchuk et al., 2002; Bergstresser et al., 2006).

Pension plans, however, differ in ways that deserve clarification. Plans are structured as a defined-contribution or defined-benefits

<sup>4</sup> There are different TARP funds injection programs including the Capital Purchase Program (CPP), Capital Assessment Program (CAP), and Supervisory Capital Assessment Program (SCAP). Our study focuses only on those public banks that received CPP, funded via the \$700 billion Troubled Asset Relief Program (TARP).

<sup>5</sup> See: <http://money.cnn.com/2010/09/15/news/companies/thebuzz/>.

plan. In a defined-contribution plan, the firm agrees to make specified contributions each period to the executive's pension. The accumulated benefits are portable across jobs and unaffected by early exit. This feature makes defined-contribution plans unattractive for retaining executives. In defined benefits plans, the firm agrees to provide benefits to the executive upon retirement based on a preset formula. Two common forms of this plan type are the qualified and non-qualified plans. Qualified plans have restrictions, including minimum funding levels and participation. In addition, firms generally obtain a current tax deduction on funds paid into the plans, and the participants' tax liability is deferred. The benefits are insured by the Pension Benefit Guaranty Corporation, but are not portable across jobs. A participant must remain with the firm until retirement to obtain the benefits. The non-portability feature acts as a disincentive for premature exit by the participant, which explains its popularity among firms as a mechanism to attract and retain top executives (Clark and Quinn, 1999).

To provide context for empirical predictions, we focus on the CEO's pension benefits attributable to defined-benefit plans, which we simply refer to as "CEO pension".<sup>6</sup> In the context of TARP, defined benefit plans have several features that the banks can exploit to deal with the incentive effects of the TARP restrictions. First, the limited disclosure rules would allow banks to be less transparent about any changes to existing plans and minimize public/political outrage that could accompany full disclosure (Bebchuk and Fried, 2004). Second, the non-portability feature and discretion over several pension elements would allow banks to modify their plans to alleviate career concerns among valuable executives who might otherwise exit the bank due to the TARP restrictions. From an optimal contracting perspective, banks will substitute towards such plans when doing so provides better and cost-effective incentives for executive effort (Edmans and Liu, 2011; Gerakos, 2010b; Lazear, 1979; Scholes et al., 2002).

The defined-benefits plans are particularly attractive for retaining CEOs. First, the wide-spread cash shortage among banks during the *run-up* to TARP is likely to increase the demand for non-cash compensation as an incentive device. Edmans and Liu (2011) show that inside debt is an attractive incentive device, especially for firms with elevated probability of bankruptcy and high leverage. Gerakos (2010a) also finds a negative association between pay and pensions for a sample of S&P 500 CEOs and views the result as evidence that CEOs trade pay for pensions to equalize differences in pay across contexts and tasks. Furthermore, public sentiments against cash compensation for bank executives creates incentives to substitute towards a scheme, such as pensions, that will attract less public scrutiny. If TARP recipients substituted towards pension plans after accepting TARP funds, one would observe a positive shift in pensions for CEOs that remained in their roles after their banks accepted TARP funds. The associated hypothesis is:

**H2.** There is an increase in pension benefits for CEOs who remain after their banks accepted TARP funds.

### 3. Research design

#### 3.1. Sample description

We obtain 927 recipients of TARP funds from ProPublica, from 2007 to 2012.<sup>7</sup> ProPublica tracks TARP recipients and collects data on the amount of funds disbursed and returned, as well as the dates of TARP entry and exit. We then restrict the sample to publicly-traded banks due to a lack of necessary data for privately-held banks. This results in an initial sample of 283 banks. Financial data for the banks are obtained from Compustat and this step eliminates 19 banks that do not have valid information. For the remaining 264 banks, we obtain compensation and CEO turnover data from Capital IQ and proxy statements, as well as 8K reports. Execucomp and Capital IQ provide corporate governance data (board size, CEO duality) for 79 unique banks (516 bank-year observations), and missing governance data is hand collected from banks' proxy statements. Lastly, we drop five banks that do not have stock returns data on CRSP to create the final sample of 259 public banks that accepted TARP funds.

We split the sample further into *ceo\_stay* and *ceo\_resign* banks. *ceo\_stay* banks did not experience CEO resignations, whereas *ceo\_resign* banks experienced CEOs resignations during the TARP period. Since each bank entered and exited TARP at different times, the TARP period is defined as the time period from the year the bank accepted the TARP funds until the year it paid off the funds. We identify CEO exit by reviewing the bank's proxy filings; an exit is deemed to have occurred when a CEO is listed in one year but not in the next year. Table 1 summarizes the sampling process. Out of a total of 259 sample banks, 79 percent are *ceo\_stay* banks.

#### 3.2. Methodology

##### 3.2.1. Performance analysis design

To examine the effect of CEO resignation on the performance of banks that accepted TARP funds, we estimate the following model:

$$\begin{aligned}
 ROA_{it} = & \alpha + \beta_1 Resign_{it} + \beta_2 CEO\_AfterResign_{it} + \beta_3 CEO\_Comp_{it-1} + \beta_4 ROA_{it-1} \\
 & + \beta_5 ROA_{it-1} \times Resign_{it} + \beta_6 NCOFF_{it} + \beta_7 Ln\_bal_{it} + \beta_8 Size_{it} + \beta_9 Tier1\_Ratio_{it} \\
 & + \beta_{10} MTB_{it} + \beta_{11} ROA\_Vol_{it} + \beta_{12} RET\_Vol_{it} + \beta_{13} CEO\_Owner\%_{it} + \beta_{14} Duality_{it} \\
 & + \beta_{15} Ln\_Board_{it} + \beta_{16} Yr2008 + \beta_{17} Yr2009 + \varepsilon_{it}
 \end{aligned} \tag{1}$$

<sup>6</sup> For the initial analysis, we combine qualified and non-qualified plans since it is likely that the banks use both plan types to offer overall benefit level that mitigates the effects of TARP on executives' annual compensation.

<sup>7</sup> The data are available at <http://projects.propublica.org/bailout/list/simple>.

**Table 1**  
Sample selection.

	No. of banks	No. of observations
Publicly traded TARP recipients listed on the ProPublica website <sup>a</sup>	283	1698
Less:		
Banks with missing values on Compustat	(19)	(198)
Banks with missing values on CRSP	(5)	(78)
Final sample of TARP recipients	259	1422

<sup>a</sup> See: <http://projects.propublica.org/bailout/list/simple>. The sample period is from 2007 to 2012.

where

*ROA* = Ratio of operating income before depreciation to total assets;

*Resign* = Dummy variable, coded 1 if the CEO resigns during the TARP period, coded 0 otherwise. The TARP period is the period after the bank accepts TARP but before it pays off TARP funds;

*CEO\_AfterResign* = Dummy variable, coded 1 for all years subsequent to the first CEO resignation after the bank accepts TARP funds, and coded 0 otherwise;

**Control variables (for each firm year):**

*CEO\_Comp* = Natural log of CEO total compensation;

*NCOFF* =  $(-1) \times$  reported net charges-off (Compustat item NCO)/total assets;

*Ln\_bal* = Natural log of the balance of TARP funds scaled by total assets;

*Size* = Natural log of total assets;

*Tier1\_Ratio* = Total common equity excluding intangible assets plus equity reserves divided by total assets;

*MTB* = Ratio of market value to book value of equity;

*ROA\_Vol* = ROA volatility, calculated as the standard deviation of ROA for the most recent five years;

*RET\_Vol* = Stock returns volatility, calculated as the standard deviation of annual returns for the most recent five years;

*CEO\_Owner%* = Ratio of shares owned by the CEO to total common shares outstanding; *Duality* = Dummy variable set to 1 if the CEO also is chairman of the board, and it is set to 0 otherwise;

*Ln\_Board* = Natural log of number of board members;

*Yr2008* = Dummy variable set to 1 if the fiscal year is 2008, and 0 otherwise;

*Yr2009* = Dummy variable set to 1 if the fiscal year is 2009, and 0 otherwise.

The coefficient on *Resign* represents the mean difference in performance between *ceo\_resign* and *ceo\_stay* banks. We focus on  $\beta_2$  that measures the differential ROA between the pre- and post-resignation periods for *ceo\_resign* banks compared to that for *ceo\_stay* banks.  $\beta_2$  will be positive (negative) when the performance of *ceo\_resign* banks is better (worse) than that of *ceo\_stay* banks after the CEO's resignation. *CEO\_Comp*<sub>*it-1*</sub> controls for the impact of prior-year CEO compensation on the current performance, and *ROA*<sub>*it-1*</sub> controls for the feedback effect in the compensation-performance relation. We include such firm characteristics that can affect ROA performance as market-to-book ratio, Tier1 Ratio, ROA volatility, and return volatility. *NCOFF* is the reported amount of asset write-downs minus recoveries of previous write-downs, deflated by total assets. It controls for the potential effect of assets write-down on ROA. The unpaid balance of the TARP funds is a proxy for the strength of government oversight over the bank's activities. *CEO\_Owner%*, *Duality*, and *Ln\_Board* control for the impact of the CEO characteristics and corporate governance on performance, while *Yr2008* and *Yr2009* control for economic conditions during 2008 and 2009.

As an alternative to Model (1), we estimate a change model that expresses change in firm performance ( $\Delta ROA$ ) as a function of CEO resignation. An indicator, *Neg\_ΔCEO\_Comp*, is set to 1 if the change in compensation in the TARP acceptance year is negative, and it is set to 0 otherwise. This variable captures the effect of any TARP-related pay reductions on firm performance. The corresponding specification is:

$$\begin{aligned}
 \Delta ROA_{it} = & \alpha + \beta_1 Resign_{it} + \beta_2 CEO\_AfterResign_{it} + \beta_3 \Delta CEO\_Comp_{it-1} \\
 & + \beta_4 Neg\_ΔCEO\_Comp_{it} + \beta_5 Neg\_ΔCEO\_Comp_{it} \times Resign_{it} + \beta_6 \Delta ROA_{it-1} \\
 & + \beta_7 \Delta ROA_{it-1} \times Resign_{it} + \beta_8 NCOFF_{it} + \beta_9 Ln\_bal_{it} + \beta_{10} Size_{it} + \beta_{11} Tier1\_Ratio_{it} \\
 & + \beta_{12} MTB_{it} + \beta_{13} ROA\_Vol_{it} + \beta_{14} RET\_Vol_{it} + \beta_{15} CEO\_Owner\%_{it} + \beta_{16} Duality_{it} \\
 & + \beta_{17} Ln\_Board_{it} + \beta_{18} Yr2008 + \beta_{19} Yr2009 + \varepsilon_{it}
 \end{aligned} \tag{2}$$

where  $\Delta ROA$  equals the change in ROA, and  $\Delta CEO\_Comp_{it-1}$  is the change in the log of lagged CEO total compensation. The remaining variables are as defined in Model (1).  $\Delta CEO\_Comp_{it-1}$  controls for the impact of prior-period change in total compensation on current performance. The coefficients,  $\beta_4$  and  $\beta_5$ , capture the effects of reduction in total compensation in the TARP acceptance year on firm performance for *ceo\_stay* and *ceo\_resign* banks.



### 3.2.2. Pension analysis design

To test H2, we use a difference-in-differences approach to estimate the effect of TARP on the CEOs' pension. The model is given as follows:

$$\begin{aligned} CEO\_Pension_{it} = & \alpha + \beta_1 Stay_{it} + \beta_2 After_{it} + \beta_3 Stay_{it} \times After_{it} + \beta_4 ROA_{it} + \beta_5 MTB_{it} \\ & + \beta_6 RET_{it} + \beta_7 Size_{it} + \beta_8 Idiosyncratic_{it} + \beta_9 Default\_Risk_{it} + \beta_{10} CEO\_Age_{it} \\ & + \beta_{11} Service\_Years_{it} + \beta_{12} Duality_{it} + \beta_{13} CEO\_Owner\%_{it} + \beta_{14} Ln\_Board_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

where

*CEO\_Pension* = Natural log of ratio of CEO pension to total cash compensation;

*Stay* = Dummy variable, it is coded as 1 if the bank does not have a CEO resignation during the TARP period, and 0 otherwise. The TARP period is the period after the bank accepts TARP but before it exits TARP;

*After* = Dummy variable coded 1 if the period is post TARP, and 0 otherwise;

#### Control variables

*ROA* = Ratio of operating income before depreciation to total assets;

*MTB* = Ratio of market value to book value of equity;

*RET* = Annual buy-and-hold returns computed as the ratio of change in market value of equity (including dividends) to prior-period market value of equity return;

*Size* = Natural log of total assets;

*Idiosyncratic* = Standard deviation of the differences between a firm's annual return and equally weighted return for the past five years;

*Default\_Risk* = One minus *Tier1\_Ratio*. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets;

*CEO\_Age* = CEO age;

*Service\_Years* = Natural log of years of credited services CEO has under the company's pension plan;

*CEO\_Owner%* = Ratio of shares owned by the CEO to total common shares outstanding;

*Duality* = 1 if the CEO also serves as chairman of the board, and 0 otherwise; and

*Ln\_Board* = Natural log of number of board members.

The coefficient on *Stay*,  $\beta_1$ , captures the difference in CEO's pension between *ceo\_stay* and *ceo\_resign* banks. The coefficient,  $\beta_2$ , reflects the change in CEO's plan benefits for *ceo\_resign* banks between pre- and post-TARP periods. The variable of interest is the interaction term, *Stay* × *After*. The coefficient on this interaction term,  $\beta_3$ , reflects the change in CEO's pension between pre- and post-TARP periods for *ceo\_stay* banks, compared to the change over the same interval for *ceo\_resign* banks. The coefficient will be positive (negative) to the extent that the change in CEO pension is more positive (negative) for *ceo\_stay* banks compared to *ceo\_resign* banks.

Following Gerakos (2010b), we include firm size, firm performance, and investment opportunities as control variables.<sup>8</sup> Firm size and firm performance are expected to be positively associated with pensions. The effect of investment opportunities will be negative to the extent that firms with greater investment opportunities substitute more (less) toward equity-based compensation (inside debt). We control for the CEO's age since pension benefits increase in age up to the plan retirement age. We also include the CEO's years of credited service to control for its cumulative effect on pensions.

In model (3), for banks with CEO resignations, pension changes between the pre- and post-TARP period may arise due to employment of different CEOs. To address this issue, we conduct a difference-in-difference analysis using a combined sample of TARP banks and non-TARP banks that had no CEO resignations. The model is specified as follows:

$$\begin{aligned} CEO\_Pension_{it} = & \alpha + \beta_1 TARP\_bank_{it} + \beta_2 Post2009_{it} + \beta_3 TARP\_bank_{it} \times Post2009_{it} + \beta_4 ROA_{it} \\ & + \beta_5 MTB_{it} + \beta_6 RET_{it} + \beta_7 Size_{it} + \beta_8 Idiosyncratic_{it} + \beta_9 Default\_Risk_{it} + \beta_{10} CEO\_Age_{it} \\ & + \beta_{11} Service\_Years_{it} + \beta_{12} Duality_{it} + \beta_{13} CEO\_Owner\%_{it} + \beta_{14} Ln\_Board_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

where

*TARP\_bank* = Dummy variable, coded as 1 if the bank received TARP funds, and 0 otherwise;

*Post2009* = Dummy variable, it is coded as 1 if the fiscal year is post 2009, and 0 otherwise;

The remaining variables are as defined in Model (3). The coefficient on *TARP\_bank* measures the difference in CEO pension between banks that accepted TARP funds and banks that declined TARP funds. The coefficient on *Post2009*,  $\beta_2$ , indicates the change in CEO pension benefits between pre- and post-TARP acceptance years. The variable of interest is the interaction term,

<sup>8</sup> Gerakos (2010b) includes research and development costs (R&D) and property, plant, and equipment (PP&E) as determinants of pension. We omit R&D and PP&E in the model because they are nominal for banks.

$TARP\_bank \times Post2009$ , which measures the change in CEO pension between pre- and post-TARP periods for TARP banks, compared to the change over the same interval for non-TARP banks. The coefficient on the interaction,  $\beta_3$ , will be positive (negative) to the extent that the change in CEO pension is more positive (negative) for banks that accepted TARP funds, compared to banks that declined TARP funds.

### 3.2.3. The incentives for CEOs to stay

Our analysis also focuses on whether pension arrangements by TARP banks influenced the decision of some bank CEOs to remain in their roles during the TARP period, despite the restrictions on their annual compensation. In our sample, 205 out of 259 CEOs, or about 79% of the sample, remained in their roles.<sup>9</sup> To test whether pension benefits affected the likelihood that the CEO of a TARP bank stayed, we estimate the following logit model:

$$\begin{aligned} Prob[Stay_{it} = 1] = & \alpha + \beta_1 After_{it} + \beta_2 Ln\_CEO\_Pension_{it} + \beta_3 Ln\_CEO\_Pension_{it} \times After_{it} \\ & + \beta_4 CEO\_Comp_{it} + \beta_5 ROA_{it} + \beta_6 MTB_{it} + \beta_7 RET_{it} + \beta_8 Size_{it} + \beta_9 Idiosyncratic_{it} \\ & + \beta_{10} Default\_Risk_{it} + \beta_{11} CEO\_Age_{it} + \beta_{12} Duality_{it} + \beta_{13} CEO\_Owner\%_{it} \\ & + \beta_{14} Ln\_Board_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

where  $Ln\_CEO\_Pension$  is natural log of the CEO's pension. The remaining variables are as defined before. The coefficient on  $After$ ,  $\beta_1$ , captures the impact of TARP acceptance on CEO's decision to stay. The coefficient on  $Ln\_CEO\_Pension$ ,  $\beta_2$ , captures the main effect of the CEO's pension on the likelihood function. Our main interest is on the term,  $Ln\_CEO\_Pension \times After$ ; its coefficient measures the incremental effect of CEO pension on the CEO's decision to stay after the bank accepts the TARP funds. The model also includes several control variables—  $Size$ ,  $ROA$ ,  $RET$ ,  $Idiosyncratic$ , and  $Default\_risks$ .  $ROA$  and  $RET$  are expected to be positively associated with the likelihood that a CEO stays; the effect of  $Idiosyncratic$  on the likelihood function is expected to be negative. The CEO characteristics include  $CEO\_Comp$ ,  $CEO\_Age$ ,  $Duality$ ,  $CEO\_Owner\%$ , and  $Ln\_Board$ .  $CEO\_Comp$  controls for the effect of current total compensation on the likelihood function.  $CEO\_Owner\%$ ,  $Duality$ , and  $Ln\_Board$  serve as proxies for managerial power and are expected to load positively on the likelihood function.

### 3.3. Descriptive statistics

Table 2 provides the descriptive statistics for the key variables for each group. The overall mean ROA is comparable between  $ceo\_stay$  and  $ceo\_resign$  banks (0.014 versus 0.015). However, based on unreported t-tests, stock return volatility is higher for  $ceo\_resign$  banks. In other words,  $ceo\_resign$  banks appear to face greater uncertainty, judging by their higher volatility of their stock returns. Median pension is significantly higher for  $ceo\_stay$  banks, although the mean is higher for  $ceo\_resign$  banks.  $CEO\_Comp$  is slightly higher for  $ceo\_resign$  banks, but the difference is not significant, while CEO ownership is higher for  $ceo\_stay$  banks. The remaining variables are largely comparable between the two groups.

Table 3 provides Pearson correlation coefficients among the variables. In general, the correlations among CEO pension, corporate governance variables, firm characteristics, and compensation are as expected. For example,  $CEO\_Pension$  is positively correlated with default risk, CEO age, firm size, CEO duality, and board size, and negatively correlated with idiosyncratic risk, and CEO ownership. Additionally, change in ROA correlates positively with CEO ownership and return volatility, but it is negatively correlated with default risk.

## 4. Empirical results

### 4.1. Difference-in-differences analyses

We begin our analysis with univariate comparisons of firm performance (ROA) and CEO pension value around the acceptance of TARP funds using a difference-in-difference design. The differences in these variables between the pre-TARP period (2007–2009) and post-TARP period (2010–2012) are calculated and then compared using t-tests; the results are also compared between  $ceo\_resign$  and  $ceo\_stay$  banks. This design controls for unobserved and observed differences between  $ceo\_resign$  and  $ceo\_stay$  banks. Panel A of Table 4 reports mean values of changes in *Industry-adjusted* ROA between the pre- and post-TARP periods for  $ceo\_resign$  and  $ceo\_stay$  banks, where the *Industry-adjusted* ROA is obtained by subtracting the industry median ROA from the ROA for the current year.<sup>10</sup> The industry adjustment further controls for the effects of factors common to all industry members. There are 1131 (291) bank-years in  $ceo\_stay$  banks ( $ceo\_resign$  banks). For the  $ceo\_stay$  banks, the mean change in *Industry-adjusted* ROA in the pre-TARP period is  $-0.001$  and becomes  $0.000$  in the post-TARP period, an increase of 100%. Over the same period,  $ceo\_resign$  banks experience an increase in the mean change of *Industry-adjusted* ROA from  $-0.003$  to  $0.003$ , an increase of 200%. Interestingly, the increase in mean change of *Industry-adjusted* ROA is significantly higher for  $ceo\_resign$  banks than for  $ceo\_stay$  banks (by  $0.004$ ), which implies greater improvement in ROA for  $ceo\_resign$  banks. This is consistent with H1 that TARP-induced CEO resignations are linked to subsequent improvement in the profit performance of the banks.

<sup>9</sup> The samples in Cadman et al. (2012) and Cazier (2014) show similar compositions of continuing CEOs.

<sup>10</sup> Since U.S. government only provides TARP funds to financial institutions, our sample banks are all from one industry.

**Table 2**  
Descriptive statistics.

	Mean	Median	Std. Dev.
Panel A: <i>ceo_stay</i> banks <sup>a</sup>			
<i>ROA</i>	0.014	0.017	0.012
<i>CEO_Pension</i>	0.952	0.840	0.866
<i>CEO_Comp</i>	13.554	13.361	1.372
<i>Ln_bal</i>	2.252	3.042	1.409
<i>Size</i>	7.965	7.553	1.740
<i>NCOFF</i>	0.008	0.004	0.009
<i>Tier1_Ratio</i>	0.068	0.067	0.031
<i>MTB</i>	1.032	0.884	3.588
<i>ROA_Vol</i>	0.007	0.005	0.006
<i>RET_Vol</i>	0.466	0.328	1.431
<i>Idiosyncratic</i>	0.083	0.069	0.058
<i>Default_Risk</i>	0.932	0.933	0.031
<i>CEO_Age</i>	57.029	57.000	6.410
<i>Service_Years</i>	1.407	1.386	0.989
<i>CEO_Owner%</i>	0.025	0.009	0.051
<i>Duality</i>	0.337	0.000	0.473
<i>Board Size</i>	10.815	10.000	3.151
No. of banks	205		
No. of obs.	1131		
Panel B: <i>ceo_resign</i> banks <sup>b</sup>			
<i>ROA</i>	0.015	0.017	0.016
<i>CEO_Pension</i>	1.028	0.542	1.088
<i>CEO_Comp</i>	13.809	13.382	1.288
<i>Ln_bal</i>	2.226	3.045	1.405
<i>Size</i>	8.372	7.945	1.937
<i>NCOFF</i>	0.009	0.006	0.012
<i>Tier1_Ratio</i>	0.079	0.069	0.084
<i>MTB</i>	0.962	0.888	0.515
<i>ROA_Vol</i>	0.009	0.007	0.007
<i>RET_Vol</i>	0.728	0.332	1.913
<i>Idiosyncratic</i>	0.092	0.072	0.067
<i>Default_Risk</i>	0.921	0.931	0.084
<i>CEO_Age</i>	56.617	57.000	6.718
<i>Service_Years</i>	1.030	0.693	0.986
<i>CEO_Owner%</i>	0.019	0.004	0.096
<i>Duality</i>	0.358	0.000	0.480
<i>Board Size</i>	11.438	11.000	2.969
No. of banks	54		
No. of obs.	291		

#### Variable definition

*ROA* = Ratio of operating income before depreciation to total assets;

*CEO\_Pension* = Natural log of the ratio of CEO pension to total CEO cash compensation;

*CEO\_Comp* = Natural log of CEO total compensation;

*Ln\_bal* = Natural log of the balance of TARP funds scaled by the total assets;

*Size* = Natural log of total assets;

*NCOFF* =  $(-1) \times$  reported net charges-off (Compustat item NCO)/total assets;

*Tier1\_Ratio* = Total common equity excluding intangible assets, plus equity reserves and then divided by total assets;

*MTB* = Ratio of market value to total common equity;

*ROA\_Vol* = ROA volatility, calculated as the standard deviation of ROA in the past five years;

*RET\_Vol* = Market return volatility, calculated as the standard deviation of stock returns in the past five years;

*Idiosyncratic* = Idiosyncratic risk, calculated as the standard deviation of the differences between firm's annual return and equally weighted return in the past five years;

*Default\_Risk* = One minus *Tier1\_Ratio*;

*CEO\_Age* = Age of the CEO;

*Service\_Years* = Natural log of years of credited services CEO has under the company's pension plan;

*CEO\_Owner%* = Ratio of the number of shares owned by the CEO to total common shares outstanding;

*Duality* = 1 if the CEO also is chairman of the firm, 0 otherwise; and

*Board Size* = Number of board members.

<sup>a</sup> *ceo\_stay* banks are banks that did not experience CEO resignations during the TARP period.

<sup>b</sup> *ceo\_resign* banks are banks that experienced CEO resignations during the TARP period.



**Table 3**  
Pearson correlation coefficients.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)AROA															
(2)CEO_Pension	-0.088														
(3)CEO_Comp	0.009	0.284													
(4)Size	-0.038	0.204	0.640												
(5)NCOFF	-0.131	-0.071	-0.069	0.083											
(6)MTB	0.045	0.067	0.118	0.008	-0.020										
(7)ROA_Vol	0.041	-0.121	-0.013	0.144	0.599	-0.004									
(8)RET_Vol	0.186	-0.104	-0.072	0.001	0.151	0.014	0.270								
(9)Idiosyncratic	0.102	-0.155	-0.091	-0.064	0.353	0.045	0.384	0.166							
(10)Default_Risk	0.023	0.357	0.086	0.044	0.046	0.027	-0.015	-0.139	0.069						
(11)CEO_Age	0.048	0.004	0.026	-0.028	-0.033	0.030	-0.043	-0.066	-0.004	-0.048					
(12)Service_Years	0.128	-0.036	-0.025	-0.154	0.027	-0.001	0.023	-0.066	-0.034	-0.016	0.047				
(13)CEO_Owner%	-0.021	0.289	0.264	0.305	0.059	-0.007	0.050	0.089	0.075	-0.558	0.130	-0.009			
(14)Duality	-0.023	0.144	0.192	0.343	-0.007	0.069	0.043	-0.051	-0.046	-0.008	0.247	0.000	0.198		
(15)Board_Size					0.013	-0.022	0.004	0.051	-0.086	0.096	0.002	-0.025	-0.193	0.025	

Variable definition:

AROA = Change of ROA. ROA is ratio of operating income before depreciation to total assets;

CEO\_Pension = Natural log of the ratio of the CEO pension to the total cash compensation received by the CEO;

CEO\_Comp = Natural log of CEO total compensation;

Size = Natural log of total assets;

NCOFF = (-1) × reported net charges-off (Compustat item NCO)/total assets;

MTB = Ratio of market value to total common equity;

ROA\_Vol = ROA volatility, calculated as the standard deviation of ROA in the past five years;

RET\_Vol = Returns volatility, calculated as the standard deviation of stock returns in the past five years;

Idiosyncratic = Idiosyncratic risk is the standard deviation of difference between firm's annual return and equal weighted return in the past five years;

Default\_Risk = One minus Tier1\_Ratio. Tier1\_Ratio is calculated as (total common equity excluding intangible assets + equity reserves)/total assets;

CEO\_Age = Age of the CEO;

Service\_Years = Natural log of years of credited services CEO has under the company's pension plan;

CEO\_Owner% = Ratio of the number of shares owned by the CEO to total common shares outstanding;

Duality = 1 if the CEO also is chairman of the firm, 0 otherwise; and

Board\_Size = Number of board members.

**Table 4**  
Difference-in-difference analysis.

Panel A: Difference-in-difference analysis in *Industry-adjusted ROA* around the TARP acceptance  
*ceo\_stay* and *ceo\_resign* banks

<i>Industry-adjusted ROA</i>		Pre-TARP	Post-TARP	(b)-(a)	t-value
		(a)	(b)		
<i>ceo_stay</i> banks bank-years =1,131	(i)	-0.001	0.000	0.001	2.123
<i>ceo_resign</i> banks bank-years =291	(ii)	-0.003	0.003	0.005	3.048
(ii)-(i)				0.004	2.212

Panel B: Difference-in-difference analysis in *Industry-adjusted CEO\_Pension* around the TARP acceptance for *ceo\_stay* and *ceo\_resign* banks

<i>Industry-adjusted CEO_Pension</i>		Pre-TARP	Post-TARP	(b)-(a)	t-value
		(a)	(b)		
<i>ceo_stay</i> banks bank-years =597	(i)	0.019	0.310	0.290	4.041
<i>ceo_resign</i> banks bank-years =184	(ii)	0.402	0.022	-0.380	-2.471
(i)-(ii)				0.670	3.949

*Industry-adjusted ROA* is industry-median adjusted *ROA* change. *ROA* is ratio of operating income before depreciation to total assets. *Industry-adjusted CEO\_Pension* is industry-median adjusted *CEO\_Pension*. *CEO\_Pension* is the natural log of the ratio of CEO pension to total cash compensation received by the CEO. Since U.S. government only provides TARP funds to financial institutions, our sample firms are all from one industry. We assess the significance of the difference-in-differences values (i.e., the lower right-hand-side number in each panel) by comparing the means of change from the pre-TARP period (year 2007–2009) to the post-TARP period (year 2010–2012) between *ceo\_stay* banks and *ceo\_resign* banks using t-tests. The drop in bank-years for pension analysis is primarily due to invalid or missing pension data for those bank-years.

Panel B of Table 4 reports the mean *Industry-adjusted CEO Pension* values in the pre-TARP and post-TARP periods for *ceo\_resign* and *ceo\_stay* banks (*Industry-adjusted CEO Pension* is the difference between the *CEO Pension* and industry median *CEO Pension* for the current year).<sup>11</sup> The adjustment controls for common CEO pension practices across the industry. In *ceo\_stay* banks, the mean industry-adjusted value increases significantly from 0.019 in the pre-TARP period to 0.310 in the post-TARP period. In contrast, *ceo\_resign* banks experience a sharp decline in the mean value during the same period (from 0.402 to 0.022). The difference in pension change between *ceo\_stay* and *ceo\_resign* banks (0.291 – (–0.380)) is positive and highly significant. CEOs of TARP recipients that did not resign obtained higher overall pensions during the post-TARP period compared to pre-TARP period; furthermore, their post-TARP pensions are also higher than those of their counterparts in *ceo\_resign* banks. The result is consistent with H2 that there is greater increase in pension benefits for those CEOs that remained with their banks during the TARP period. This finding is a preliminary evidence in support of the view that *ceo\_stay* banks will substitute towards other permissible forms of compensation to mitigate the TARP-induced shortfall in conventional compensation for their CEOs.

#### 4.2. Regression results for the performance analysis

Table 5 reports the results from Model (1) that evaluates the effect of CEO resignations on firm performance. The compensation variable in the model is alternatively measured as total compensation ( $CEO\_Comp_{it-1}$ ), cash compensation ( $CEO\_Cash_{it-1}$ ), Black & Scholes stock-option value ( $CEO\_Option_{it-1}$ ), and restricted stock ( $CEO\_Stock_{it-1}$ ). The results are in columns (1) through (4). Across all four columns, the coefficient on *Resign* is positive and significant, which suggests that *ceo\_resign* banks have higher *ROA*, on average. More important, the coefficient on *CEO\_AfterResign* is positive and highly significant in each column ( $p$ -value < 0.0001), even after controlling

<sup>11</sup> The drop in bank-years for pension analysis is primarily due to invalid or missing pension data for the bank-years.

Table 5

Analysis of the effect of CEO resignation on the performance of banks that accepted TARP.

Dependent variable: ROA								
	(1)CEO_Comp <sub>it-1</sub>		(2)CEO_Cash <sub>it-1</sub>		(3)CEO_Option <sub>it-1</sub>		(4)CEO_Stock <sub>it-1</sub>	
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
<i>Resign</i>	0.002	0.0460	0.002	0.0420	0.003	0.0230	0.002	0.0520
<i>CEO_AfterResign</i>	0.003	0.0001	0.003	0.0001	0.005	0.0001	0.003	0.0001
<i>CEO_Comp<sub>it-1</sub></i>	0.000	0.9750						
<i>CEO_Cash<sub>it-1</sub></i>			0.000	0.4250				
<i>CEO_Option<sub>it-1</sub></i>					0.001	0.5150		
<i>CEO_Stock<sub>it-1</sub></i>							0.002	0.3560
<i>ROA<sub>t-1</sub></i>	0.138	0.0001	0.141	0.0001	0.173	0.0001	0.124	0.0001
<i>ROA<sub>t-1</sub> × Resign</i>	-0.095	0.0170	-0.097	0.0150	-0.121	0.020	-0.082	0.0460
<i>NCOFF</i>	-0.591	0.0001	-0.591	0.0001	-0.581	0.0001	-0.605	0.0001
<i>Ln_bal</i>	0.000	0.334	0.000	0.3240	0.000	0.6330	0.000	0.4210
<i>Size</i>	0.001	0.0001	0.001	0.0001	0.001	0.0010	0.001	0.0001
<i>Tier1_Ratio</i>	0.078	0.0001	0.077	0.0001	0.081	0.0001	0.076	0.0001
<i>MTB</i>	0.001	0.0010	0.001	0.0010	0.001	0.0001	0.002	0.0001
<i>ROA_Vol</i>	-0.355	0.0001	-0.349	0.0001	-0.461	0.0001	-0.362	0.0001
<i>RET_Vol</i>	0.000	0.8770	0.000	0.8070	0.000	0.1460	0.000	0.5120
<i>CEO_Owner%</i>	-0.001	0.7830	-0.001	0.8970	0.005	0.4430	0.003	0.4940
<i>Duality</i>	0.001	0.0340	0.001	0.0370	0.002	0.0220	0.001	0.0160
<i>Ln_Board</i>	-0.001	0.1810	-0.001	0.1740	-0.003	0.0270	-0.001	0.4420
<i>Yr2008</i>	-0.007	0.0001	-0.008	0.0001	-0.008	0.0001	-0.007	0.0001
<i>Yr2009</i>	-0.007	0.0001	-0.007	0.0001	-0.006	0.0001	-0.007	0.0001
<i>Intercept</i>	0.009	0.0040	0.009	0.0001	0.016	0.0001	0.009	0.0001
No. of obs.	1293		1290		675		1032	
Adj. R-square	0.665		0.666		0.672		0.700	

ROA is the ratio of operating income before depreciation to total assets. *Resign* equals 1 when the firm had CEO resignation during the TARP period, and 0 otherwise. *CEO\_AfterResign* equals 1 for the years subsequent to the first CEO resignation after accepting TARP, and 0 otherwise. *CEO\_Comp<sub>it-1</sub>* is the lag natural log of CEO total compensation. *CEO\_Cash<sub>it-1</sub>* is the lag natural log of CEO cash compensation scaled by total compensation. *CEO\_Option<sub>it-1</sub>* is the lag natural log of CEO options scaled by total compensation. *CEO\_Stock<sub>it-1</sub>* is the lag natural log of CEO restricted stocks scaled by total compensation. *ROA<sub>t-1</sub>* is lag of ROA. *NCOFF* is calculated as  $(-1) \times$  reported net charges-off (Compustat item NCO)/total assets. *Ln\_bal* is natural log of the balance of unpaid TARP funds scaled by total assets. *Size* is natural log of total assets. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *MTB* is the ratio of market value to total common equity. *ROA\_Vol* is the standard deviation of ROA in the past five years. *RET\_Vol* is the standard deviation of stock returns in the past five years. *CEO\_Owner%* is the ratio of the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board, and 0 otherwise. *Ln\_Board* is natural log of number of board members. *Yr2008* equals 1 if the fiscal year is 2008, 0 otherwise. *Yr2009* equals 1 if the fiscal year is 2009, and 0 otherwise. The *p*-values are based on two-tail test.

for various factors previously shown to affect bank profits. In other words, TARP banks whose CEOs resigned at the inception of TARP experienced a positive shift in the level of accounting profits in the periods following the resignation of their CEOs.

The results for the control variables are largely in the predicted directions. For instance, *NCOFF* is negative and significant, indicating that larger net charges-off negatively affects financial performance. Despite controlling for such an effect, we still find higher improvement in ROA for the banks that witnessed CEO resignation. As expected, *Size*, *MTB*, and *Tier1\_Ratio* are positively related with bank ROA at the 1% level, and *ROA\_Vol* is negative and significant. The slope on *Duality* is positive and significant. One interpretation of this result is that under TARP, CEO duality—a measure of unity of leadership and control—paved the way for more decisive decisions that lead to better performance. This is consistent with the stewardship theory of CEO duality (e.g., Boyd, 1995; Donaldson and Davis, 1991). The coefficients on both *Yr2008* and *Yr2009* are significantly negative, in line with the expected effect of the financial crisis on the performance of the banks. As a robustness test, we replace *Yr2008* and *Yr2009* with year fixed effects. Based on the results of this latter specification (not tabulated for brevity), the coefficient on *CEO\_AfterResign* is still positive and significant at 1% level in column (3) of Table 5 and at 5% level in column (1), (2) and (4).

The preceding results provide strong evidence that the TARP banks whose CEO resigned at the inception of TARP experienced greater performance gains subsequently, which supports H1. In other words, the *ceo\_resign* banks experienced superior profit performance in the post-TARP periods relative to that in the pre-TARP periods, in line with the notion that the TARP-induced departure of the CEOs conferred benefits to *ceo\_resign* banks.

In Table 6, we present the results based on Model (2), where change in profit rate,  $\Delta ROA$ , is the dependent variable. In Column (1), the coefficient on *CEO\_AfterResign* is positive and significant at the 1% level, providing further support for the notion that the *ceo\_resign* TARP banks experienced significant improvements in performance during the post-TARP periods.<sup>12</sup> This result corroborates

<sup>12</sup> As a robustness test, we replace *Yr2008* and *Yr2009* in Table 6 with year fixed effects. The results for *CEO\_AfterResign* (not separately tabulated) strongly corroborate those in columns (1) and (2) of Table 6.

**Table 6**

Analysis of the effect of CEO resignation on the change in performance of banks that accepted TARP.

Dependent variable: $\Delta ROA$				
	(1)		(2)	
	Estimate	p-value	Estimate	p-value
<i>Resign</i>	0.000	0.583	-0.001	0.409
<i>CEO_AfterResign</i>	0.003	0.005	0.003	0.004
$\Delta CEO\_Comp_{it-1}$	0.000	0.817	0.000	0.816
<i>Neg_ΔCEO_Comp</i>			-0.001	0.617
<i>Neg_ΔCEO_Comp</i> × <i>Resign</i>			0.002	0.346
$\Delta ROA_{t-1}$	-0.377	0.0001	-0.380	0.0001
$\Delta ROA_{t-1}$ × <i>Resign</i>	-0.098	0.087	-0.085	0.152
<i>NCOFF</i>	-0.542	0.0001	-0.541	0.0001
<i>Ln_bal</i>	0.002	0.0001	0.002	0.0001
<i>Size</i>	0.000	0.113	0.000	0.115
<i>Tier1_Ratio</i>	0.056	0.0001	0.057	0.0001
<i>MTB</i>	0.000	0.881	0.000	0.873
<i>ROA_Vol</i>	0.158	0.014	0.157	0.014
<i>RET_Vol</i>	0.001	0.0001	0.001	0.0001
<i>CEO_Owner%</i>	0.008	0.221	0.008	0.229
<i>Duality</i>	0.001	0.155	0.001	0.147
<i>Ln_Board</i>	0.000	0.979	0.000	0.993
<i>Yr2008</i>	-0.018	0.0001	-0.018	0.0001
<i>Yr2009</i>	-0.013	0.0001	-0.013	0.0001
<i>Intercept</i>	-0.003	0.400	-0.003	0.413
No. of obs.	1080		1080	
Adj. R-square	0.426		0.425	

$\Delta ROA$  is change of return on assets. *Resign* equals 1 when the firm had CEO resignation during the TARP period, and 0 otherwise. *CEO\_AfterResign* equals 1 for the years subsequent to the first CEO resignation after accepting TARP, and 0 otherwise.  $\Delta CEO\_Comp_{it-1}$  is change in lag natural log of CEO total compensation. *Neg\_ΔCEO\_Comp* is coded as 1 if  $\Delta CEO\_Comp$  is negative in the TARP acceptance year, and 0 otherwise.  $\Delta ROA_{t-1}$  is the lag of  $\Delta ROA$ . *NCOFF* is calculated as  $(-1) \times$  reported net charges-off (Compustat item NCO)/total assets. *Ln\_bal* is natural log of the balance of unpaid TARP funds scaled by total assets. *Size* is natural log of total assets. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *MTB* is the ratio of market value to total common equity. *ROA\_Vol* is the standard deviation of ROA in the past five years. *RET\_Vol* is the standard deviation of stock returns in the past five years. *CEO\_Owner%* is the ratio of the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board, 0 otherwise. *Ln\_Board* is natural log of the number of board members. *Yr2008* equals 1 if the fiscal year is 2008, 0 otherwise. *Yr2009* equals 1 if the fiscal year is 2009, and 0 otherwise. The *p*-values are based on two-tail test.

the univariate results reported in Table 4, and again suggests that the departure of the CEOs at the inception of TARP is associated with a positive shift in the profit performance of the banks. Column (2) of Table 6 includes the results for *Neg\_ΔCEO\_Comp* that controls for the effects of any TARP-related pay reductions on bank performance. The coefficient on *Neg\_ΔCEO\_Comp* (main effect) and on *Neg\_ΔCEO\_Comp* × *Resign* (interaction effect) are both insignificant, while the coefficient on *CEO\_AfterResign* remains positive and highly significant. We also estimate the model using change in cash compensation ( $\Delta CEO\_Cash$ ), change in Black & Scholes stock-option value ( $\Delta CEO\_Option$ ), and change in restricted stocks ( $\Delta CEO\_Stock$ ) as alternative forms of compensation. The results (omitted for brevity) show that the coefficient on *CEO\_AfterResign* is consistently positive and significant in the presence of each of the compensation variables.

As an alternative change model, we estimate a pooled, cross-sectional, time-series, simplified OLS regression, as in Magnan and St-Onge (2005). The procedure controls for time and bank-fixed effects, especially when the span of performance improvement following CEO resignation in TARP banks is short-lived and/or bank-specific. The model is given as:

$$\begin{aligned} \Delta ROA_{it} = & \alpha + \beta_1 \text{Year prior to CEO Resign}_{it} + \beta_2 \text{Year of CEO Resign}_{it} \\ & + \beta_3 \text{Year following CEO Resign}_{it} + \beta_4 \text{Two years following CEO Resign}_{it} \\ & + \beta_5 \text{Firm\_Size}_{it} + \text{Firm fixed effect} + \text{Year fixed effect} + \varepsilon_{it} \end{aligned} \quad (6)$$

*Year prior to CEO Resign* equals 1 if the fiscal year is one year prior to CEO resignation after accepting TARP, and 0 otherwise. *Year of CEO Resign* equals 1 if the fiscal year is the year of CEO resignation after accepting TARP, and 0 otherwise. *Year following CEO Resign* equals 1 if the fiscal year is one year post CEO resignation after accepting TARP, and 0 otherwise. *Two years following CEO Resign* equals 1 if the fiscal year is two years post CEO resignation after accepting TARP, and 0 otherwise. *Size* is natural log of total assets. We control for firm and year effects by including firm and year dummies, respectively, in the model. The results (not reported for brevity) show a significant improvement in ROA in the first year following participation in TARP and only a modest improvement in ROA during the second year. With the control we introduced for firm-fixed effects, the ratcheting down of ROA in the second year may reflect, among others, the intense competition in the banking industry and the well-known mean-reverting property of ROA. Overall, however, the results provide support for the results in Table 6, and show higher  $\Delta ROA$  in the post TARP period.

**Table 7**

Analysis of the effect of TARP on the pension of CEOs that stayed in (did not resign from) public banks that accepted TARP.

Dependent variable: <i>CEO_Pension</i>		
	Estimate	p-value
<i>Stay</i>	−0.494	0.001
<i>After</i>	−0.345	0.019
<i>Stay × After</i>	0.406	0.013
<i>ROA</i>	1.675	0.282
<i>MTB</i>	0.111	0.065
<i>RET</i>	−0.019	0.190
<i>Size</i>	0.056	0.004
<i>Idiosyncratic</i>	−1.637	0.004
<i>Default_Risk</i>	4.890	0.001
<i>CEO_Age</i>	0.043	< .0001
<i>Service_Years</i>	0.124	0.000
<i>Duality</i>	0.283	0.000
<i>CEO_Owner%</i>	−1.975	0.014
<i>Ln_Board</i>	0.163	0.115
<i>Intercept</i>	−6.825	< .0001
No. of obs.	697	
Adj R-square	0.222	

*CEO\_Pension* is the natural log of ratio of CEO pension to total CEO cash compensation. *Stay* equals 1 if the firm did not have CEO resignation during the TARP period, and 0 otherwise. *After* equals 1 if the firm observation is post TARP acceptance year, and 0 otherwise. *ROA* is the ratio of operating income before depreciation to total assets. *MTB* is the ratio of market value to total common equity. *RET* is the ratio of market value to total common equity. *Size* is natural log of total assets. *Idiosyncratic* is the standard deviation of the differences between firm's annual stock return and equally weighted return in the past five years. *Default\_Risk* equals one minus *Tier1\_Ratio*. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *CEO\_Age* is the age of CEO. *Service\_Years* is the natural log of years of credited services CEO has under the company's pension plan. *CEO\_Owner%* is the ratio of the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board, and 0 otherwise. *Ln\_Board* is the natural log of the number of board members. The p-values in above table are based on one-tail test.

#### 4.3. Regression results for the pension analysis

H2 predicts a post-TARP increase in the level of defined pension benefits for the CEOs of the *ceo\_stay* banks, following the explicit limits that TARP imposed on the traditional compensation elements for bank executives. We estimate Model (3) to test for a shift in defined benefits arrangements for the CEOs of those banks that had no CEO resignations at the inception of TARP. In particular, we test whether TARP banks with CEOs who remained in their positions after the inception of TARP offered greater levels of plan benefits to their CEOs relative to the pre-TARP level. The results are reported in Table 7.

The coefficient on *Stay* is negative and significant, suggesting that prior to TARP, CEO pension in *ceo\_stay* banks is generally lower than that in *ceo\_resign* banks. The coefficient on *After* is also negative and significant at the 5% level. However, the coefficient on *Stay × After* is positive and highly significant ( $p$ -value = 0.013).<sup>13</sup> This implies that the change in CEO's pension between pre- and post-TARP periods is significantly more positive for *ceo\_stay* banks than for *ceo\_resign* banks. In other words, compared to CEOs of *ceo\_resign* banks, CEOs who continued in their positions obtained higher pension compensation. These findings are in line with the univariate results, and provide further support confirm for the notion that TARP recipients whose CEOs did not resign at the inception of TARP increased the pension benefits for their CEOs as a mechanism to balance out the wealth-reduction effects of TARP.

As expected, the slopes on *CEO\_Age* and *Service\_Years* are reliably positive, while *Idiosyncratic* is significantly and negatively related to pension at the 1% level.<sup>14</sup> *Size* is positively associated with CEO pension at the 1% significance level, and this implies that large banks are more likely to provide high level of pension benefits for their CEOs. *Duality* is significant and positive, which is consistent with our expectation that more powerful CEOs obtain greater pension benefits. *CEO\_Owner%* is negative and significant at

<sup>13</sup> As a robustness test, we include year fixed effects in Table 7. Based on the results (not separately tabulated), the coefficient on *Stay × After* is still positive and significant at 5% level ( $p$ -value = 0.015).

<sup>14</sup> Gerakos (2010b) explains that firms with greater investment opportunities prefer to use a higher level of equity-based compensation and a lower level of accounting-based compensation (e.g., annual bonuses). Since annual bonus is a major determinant of pension benefits, such firms are more likely to provide lower levels of pension benefits.



5%, which may reflect a substitution effect between pension benefits and CEO ownership. *MTB* and *Default\_Risk* are both positive and significant as expected.

We also performed a sustainability test to examine the persistence of the pension increases in the periods following participation in TARP. The results (not reported for brevity) show that, after we control for the firm-specific and time-specific fixed effects, the pensions for the CEOs of banks that accepted TARP funds rose by 0.099 in the year of acceptance ( $p$ -value < 0.011) and by 0.025 in the following year, but insignificantly so. Overall, the results provides support for H2 and show that CEOs who stayed after their banks accept TARP funds experienced a positive shift in their defined pension benefits. The finding raises the prospect that the increases in defined plan benefits for the CEOs of the *ceo\_stay* banks are part of the banks' strategy to mitigate the adverse wealth effects of the TARP restrictions on their CEOs.

A potential issue with the results in Tables 5–7 is the possibility that the decision to stay or resign by the CEO of a TARP bank is endogenous to the banks' contracting process. To mitigate the potential effects of such endogeneity, we follow the two-stage technique specified in Heckman (1979). In the first stage, we run a probit model and the dependent variable is the CEO resign/stay choice. The independent variables include ROA, CEO age, corporate governance, and other firm characteristics. In the second stage, we enter the correction term, the inverse Mill's ratio (IMR) derived from the first stage model, and re-estimate the models in Tables 5–7. The results (which we omit for brevity) lead to the same inferences as those based on the models reported in the text. As an additional robustness check, we estimate the probit model in the first stage and then use the predicted value of *Resign* in the second stage models and results (not reported) remain similar to those presented in the text.

#### 4.4. Additional analysis

##### 4.4.1. Combined sample of TARP and non-TARP banks without CEO resignation

In this section, we perform a difference-in-difference analysis based on Model (4) for a combined sample of TARP banks that had no CEO resignation in the periods before and after the inception of TARP and non-TARP banks that had no CEO resignations over the same periods. The observations for non-TARP banks provide some control for the effects of industry-wide factors on bank performance. The results of this latter analysis are presented in Table 8. The coefficient on *TARP\_bank* is insignificant, indicating that there is no difference in pension between the TARP and non-TARP banks. The coefficient on *Post2009* is negative and significant, indicating

**Table 8**

Analysis of the effect of TARP on the pension of CEOs that stayed in (did not resign from) public banks (TARP and non-TARP banks).

Dependent variable: <i>CEO_Pension</i>		
	Estimate	p-value
<i>TARP_bank</i>	0.242	0.3250
<i>Post2009</i>	-0.754	0.0150
<i>TARP_bank</i> × <i>Post2009</i>	0.868	0.0780
<i>ROA</i>	1.396	0.3090
<i>MTB</i>	-0.487	0.0001
<i>RET</i>	-0.616	0.0120
<i>Size</i>	0.827	0.0001
<i>Idiosyncratic</i>	-3.848	0.0410
<i>Default_Risk</i>	4.329	0.0001
<i>CEO_Age</i>	0.158	0.0001
<i>Service_Years</i>	2.116	0.0001
<i>Duality</i>	0.793	0.0040
<i>CEO_Owner%</i>	-0.083	0.0330
<i>Ln_Board</i>	3.244	0.0001
<i>Intercept</i>	-19.929	0.0001
No. of obs.	1743	
Adj R-square	0.357	

*CEO\_Pension* is the natural log of ratio of CEO pension to total CEO cash compensation. *TARP\_bank* equals 1 if the firm received TARP funds, and 0 otherwise. *Post2009* equals 1 if the fiscal year is post 2009, and 0 otherwise. *ROA* is the ratio of operating income before depreciation to total assets. *MTB* is the ratio of market value to total common equity. *RET* is the ratio of market value to total common equity. *Size* is natural log of total assets. *Idiosyncratic* is the standard deviation of the differences between firm's annual stock return and equally weighted return in the past five years. *Default\_Risk* equals one minus *Tier1\_Ratio*. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *CEO\_Age* is the age of CEO. *Service\_Years* is the natural log of years of credited services CEO has under the company's pension plan. *CEO\_Owner%* is the ratio of the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board, and 0 otherwise. *Ln\_Board* is the natural log of the number of board members. The  $p$ -values are based on one-tail tests.

**Table 9**  
Logit analysis of the effect of pension on CEO turnover after their banks accepted TARP.

Dependent variable: <i>Stay</i>		
	Estimate	p-value
<i>After</i>	−0.921	0.208
<i>Ln_CEO_Pension</i>	−0.104	0.042
<i>Ln_CEO_Pension</i> × <i>After</i>	0.105	0.052
<i>CEO_Comp</i>	−0.158	0.174
<i>ROA</i>	16.665	0.049
<i>MTB</i>	−0.150	0.489
<i>RET</i>	0.011	0.855
<i>Size</i>	−0.096	0.226
<i>Idiosyncratic</i>	−7.124	0.000
<i>Default_Risk</i>	13.497	0.005
<i>CEO_Age</i>	0.010	0.496
<i>Duality</i>	−0.045	0.845
<i>CEO_Owner%</i>	1.826	0.596
<i>Ln_Board</i>	−0.861	0.040
<i>Intercept</i>	−5.246	0.269
No. of obs.	702	
Pseudo R <sup>2</sup>	0.0671	

*Stay* equals 1 if the firm did not experience a CEO resignation during the TARP period, and 0 otherwise. *After* equals 1 if the firm observation is post TARP acceptance year, and 0 otherwise. *Ln\_CEO\_Pension* is the natural log of CEO pension. *CEO\_Comp* is the natural log of CEO total compensation. *ROA<sub>it</sub>* is the ratio of operating income before depreciation to the total assets. *MTB* is the ratio of market value to total common equity. *RET* is the ratio of market value to total common equity. *Size* is the natural log of total assets. *Idiosyncratic* is the standard deviation of the differences between firm's annual stock return and equally weighted return for the past five years. *Default\_Risk* equals one minus *Tier 1 Ratio*. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *CEO\_Age* is the age of the CEO. *CEO\_Owner%* is the ratio the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board and 0 otherwise. *Ln\_Board* is the natural log of the number of board members. The *p*-values are based on two-tail test.

that in general, the defined pension benefits for the CEOs declined in the post-TARP period. The coefficient on our main test variable, *TARP\_bank* × *Post2009*, is positive and significant, indicating higher plan benefits for the CEOs of *ceo\_stay* TARP banks in the post-TARP periods, compared to the plan benefits for the CEOs of non-TARP banks over the same interval, supporting H2.<sup>15</sup> This latter finding suggests that industry-wide factors do not explain the increase in plan benefits for the CEOs of the *ceo\_stay* TARP banks.

#### 4.4.2. Pension benefits and the incentives for the CEO to stay

In an additional analysis, we estimate Model (5) to examine the effect of pension arrangement on the decision of some bank CEOs to remain in their roles despite TARP restrictions. In particular, we test whether plan benefits have a positive effect on the decision to stay by the CEOs of *ceo\_stay* banks, in line with H2. The results are presented in Table 9. The pension variable, *Ln\_CEO\_Pension*, has a negative and significant effect on the likelihood function. More importantly, the coefficient on the interaction term, *Ln\_CEO\_Pension* × *After*, is positive and significant (*p*-value = 0.052).<sup>16</sup> That is, plan benefits during the post-TARP period are positively associated with the likelihood that the CEO continues in that position in the TARP recipient bank. The results for control variables are largely in the predicted direction. For instance, *ROA* is positively and significantly related with *Stay*; that is, CEOs of well performing banks are likely to stay. The coefficient on *CEO\_Comp* is negative but insignificant. The coefficient on *Idiosyncratic* is negative and significant (*p*-value < 0.001), which suggests that CEOs are less likely to stay at their roles when idiosyncratic risks are high. Also, the effect of *Ln\_Board* is significant and negative, which may reflect the incremental negative effect that board monitoring has on the likelihood that CEO stays.

As an alternative design, we replace pension-level (*Ln\_CEO\_Pension*) by pension change, defined as the change in the natural log of pension ( $\Delta Ln\_CEO\_Pension$ ). Table 10 shows the results. The coefficient on  $\Delta Ln\_CEO\_Pension$  × *After* remains positive and significant (*p*-value < 0.01).<sup>17</sup> The results for the control variables are similar to those reported in Table 9 and show that default risk and CEO

<sup>15</sup> As an additional check, we include year fixed effects in Table 8. Based on the results (not separately tabulated), the coefficient on *TARP\_bank* × *Post2009* is still positive and significant at 10% level (*p*-value = 0.066).

<sup>16</sup> We also estimate an alternative design in which we control year fixed effects in Table 9. The results not separately tabulated show that the coefficient on *Ln\_CEO\_Pension* × *After* is still positive and significant (*p*-value = 0.056).

<sup>17</sup> As an alternative design, we include year fixed effects. The coefficient on  $\Delta Ln\_CEO\_Pension$  × *After* (not separately reported) is still positive and significant (*p*-value = 0.014).

**Table 10**

Logit analysis of the effect of change in pension on CEO turnover after their banks accepted TARP.

Dependent variable: <i>Stay</i>		
	Estimate	p-value
<i>After</i>	0.410	0.197
$\Delta \ln\_CEO\_Pension$	-0.237	0.036
$\Delta \ln\_CEO\_Pension \times After$	0.306	0.010
<i>CEO_Comp</i>	-0.176	0.160
<i>ROA</i>	11.719	0.193
<i>MTB</i>	-0.190	0.410
<i>RET</i>	0.018	0.758
<i>Size</i>	-0.039	0.645
<i>Idiosyncratic</i>	-7.759	0.000
<i>Default_Risk</i>	10.565	0.036
<i>CEO_Age</i>	0.005	0.787
<i>Duality</i>	-0.184	0.461
<i>CEO_Owner%</i>	24.013	0.011
<i>Ln_Board</i>	-0.991	0.034
<i>Intercept</i>	-3.413	0.493
No. of obs.	615	
Pseudo R <sup>2</sup>	0.095	

*Stay* equals 1 when the firm did not have a CEO resignation during the TARP period, and 0 otherwise. *After* equals 1 if the firm observation is post TARP acceptance year, and 0 otherwise.  $\Delta \ln\_CEO\_Pension$  is the change in natural log of CEO pension. *CEO\_Comp* is the natural log of CEO total compensation. *ROA* is the ratio of operating income before depreciation to the total assets. *MTB* is the ratio of market value to total common equity. *RET* is the ratio of market value to total common equity. *Size* is natural log of total assets. *Idiosyncratic* is the standard deviation of the differences between firm's annual stock return and equally weighted return for the past five years. *Default\_Risk* equals one minus *Tier1\_Ratio*. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *CEO\_Age* is age of the CEO. *CEO\_Owner%* is the ratio of the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board, and 0 otherwise. *Ln\_Board* is the natural log of the number of board members. The *p*-values are based on two-tail test.

ownership have positive effects on the likelihood function, whereas idiosyncratic risk and board size exert negative effects on the likelihood function. Overall, the results suggest that CEOs are more likely to continue their roles at the TARP recipient banks when they are compensated with higher pension post-TARP-acceptance.

As a robustness check, we deflate all variables in Model (5) by the Consumer Price Index (CPI). We do so to control for the possible effects of fluctuations in interest rates on the annual estimates of the pension values. The results based on this transformation in variables (which we omit for brevity) similarly show that CEO's post-TARP pension is positively associated with the likelihood that the CEO remained with the TARP bank. Similar to the results in Tables 9 and 10, the results also indicate a general decline in CEO pension for the reference banks, comprising banks whose CEOs resigned following the banks decision to accept TARP funds and the applicable restrictions on the executive compensation.

#### 4.4.3. Supplemental pension benefits and CEOs' incentive to stay

Although qualified pension benefits under the defined benefit plans provide tax advantages to both the employer/sponsor and participants, such plans impose limits on the salary of the participating executive on which annual benefits can be computed, as well as on the annual benefits that may be earned by the participant. For example, in 2006, the maximum salary on which the qualified benefits can be computed is \$220,000; in 2017, it is \$270,000 (IRC section 401(a)(17)). Furthermore, the maximum annual benefits that may be earned are \$175,000 in 2006 and \$215,000 in 2017 (IRC section 415(b)(1)(A)). With these ceilings, banks may find it difficult to use changes or modifications to qualified benefit plans to balance out the TARP-induced shortfall in compensation for their top executives. In contrast, nonqualified plans do not place limits on the salary on which qualified benefits can be computed or on the annual benefits a participant may earn. In particular, nonqualified plans allow employers to offer benefits to executives beyond the maximum allowed under qualified plans, constrained only by what the employers will afford (including lost tax benefits). Such plans vary in structure and scope, and are disclosed under a variety of labels such as *excess pension benefits*, *restoration plan benefits*, *nonqualified cash-benefits plans*. Generally, however, most firms use the term *supplemental pension benefits* to encompass the aggregate value of all nonqualified plan benefits. Notably, employers have greater control over the structure and scope of such plans, and can adjust them to fit their compensation objectives (e.g., Bergstresser et al., 2006). This later feature increases the attractiveness of supplemental plan benefits as a substitute for the TARP-induced shortfall in conventional compensation, especially for the *ceo\_stay* banks.

**Table 11**

Analysis of the effect of TARP on the supplemental pension of CEOs that stayed in (did not resign from) public banks that accepted TARP.

Panel A: Difference-in-difference analysis in CEO supplemental pension around the TARP acceptance between *ceo\_stay* and *ceo\_resign* banks

<i>Non-qual_rate</i>		Pre-TARP (a)	Post-TARP (b)	Diff (b)-(a)	%Diff [(b)-(a)]/(a)	t-value
<i>ceo_stay</i> banks bank-years=62	(i)	0.190	0.249	0.059	31.05%	0.63
<i>ceo_resign</i> banks bank-years=45	(ii)	0.477	0.256	-0.221	46.33%	-1.33
	Diff <sub>(i)</sub> - Diff <sub>(ii)</sub>			0.280	474.58%	1.53

Panel B: The effect of TARP on CEOs' supplemental pensions for *ceo\_stay* banks  
Dependent variable: *Non-qual*

	Estimate	p-value
<i>Stay</i>	-15.105	0.000
<i>After</i>	-11.524	0.001
<i>Stay</i> × <i>After</i>	12.382	0.005
<i>ROA</i>	102.974	0.235
<i>MTB</i>	0.245	0.932
<i>RET</i>	0.011	0.996
<i>Size</i>	0.536	0.370
<i>Idiosyncratic</i>	4.915	0.854
<i>Default_Risk</i>	87.397	0.092
<i>CEO_Age</i>	0.216	0.282
<i>NQService_Years</i>	0.223	0.003
<i>Duality</i>	0.994	0.609
<i>CEO_Owner%</i>	-188.481	0.096
<i>Ln_Board</i>	-4.074	0.392
<i>Intercept</i>	-78.125	0.097
No. of obs.	95	
Adj R-square	0.385	

*Non-qual\_rate* is ratio of CEO non-qualified (supplemental) pension (in millions) to years of credited services. We assess the significance of the difference-in-differences values (i.e., the lower right-hand-side number) by comparing the means of change from the pre-TARP period (year 2007–2009) to the post-TARP period (year 2010–2012) between *ceo\_stay* banks and *ceo\_resign* banks using t-tests. The drop in bank-years for pension analysis primarily is due to invalid or missing supplemental pension data or years of credited services for those bank-years.

*Non-qual* is total amount of non-qualified (supplemental) pensions (in millions) received by CEO. *Stay* equals 1 if the firm did not have CEO resignation during the TARP period, and 0 otherwise. *After* equals 1 if the firm observation is post TARP acceptance year, and 0 otherwise. *ROA* is the ratio of operating income before depreciation to total assets. *MTB* is the ratio of market value to total common equity. *RET* is the ratio of market value to total common equity. *Size* is natural log of total assets. *Idiosyncratic* is the standard deviation of the differences between firm's annual stock return and equally weighted return in the past five years. *Default\_Risk* equals one minus *Tier1\_Ratio*. *Tier1\_Ratio* is calculated as (total common equity excluding intangible assets + equity reserves)/total assets. *CEO\_Age* is the age of CEO. *NQService\_Years* is the years of credited services CEO has under the company's non-qualified (supplemental) pension plan. *CEO\_Owner%* is the ratio of the number of shares owned by the CEO to total common shares outstanding. *Duality* equals 1 if the CEO also is chairman of board, and 0 otherwise. *Ln\_Board* is the natural log of the number of board members. The *p*-values are based on two-tail test.

To examine a possible link between such pension benefits and the decision by some bank CEOs to remain with their banks despite the restrictions on their pay, we manually collect supplemental (nonqualified) benefits from the proxy filings of the 259 banks in our sample. Of the 259 banks, only 23 *ceo\_stay* banks provided separate disclosures of their supplemental plans; only 12 *ceo\_resign* banks

provided separate disclosures of their supplemental plans.<sup>18</sup> Next, we repeated the difference-in-difference test for the sub-sample using the rate of the non-qualified pensions, *Non-qual\_rate*, computed as ratio of the CEO's non-qualified pension (in millions) to years of credited services. The results are shown in Panel A of Table 11. In the post-TARP period, *Non-qual\_rate* increased by 30% for the *ceo\_stay* banks, but declined by more than 46% for the *ceo\_resign* banks. The results point to a positive shift in the supplemental plan benefits for CEOs of the *ceo\_stay* banks in the post-TARP period. Although the t-statistic for the change is not significant at the conventional level (possibly due to the small sample effect), the percentage increase of approximately 30% appears substantial. The post-TARP decline in the supplemental plan benefits for the CEOs of the *ceo\_resign* banks may be partly due to the fact that replacement plan benefits for new CEOs are often lower than those of the predecessor CEO.

Panel B of Table 11 presents the results of the multivariate test. First, the coefficient on *After* is positive and significant (*coeff. estimate* = −11.524, *p-value* < 0.001), which suggests a decline in supplemental plan benefits for CEOs of the reference banks (i.e., *ceo\_resign* banks) in the post-TARP periods. However, the coefficient on *Stay* × *After* (which estimates the incremental level of the supplemental benefits for *ceo\_stay* banks in the post-TARP periods) is positive and highly significant (*coeff. estimate* = 12.382, *p-value* < 0.005).<sup>19</sup> This latter result provides a strong evidence of a positive shift in the level of supplemental plan benefits for CEOs of the *ceo\_stay* banks, consistent with H2.

To triangulate the finding, we replace the annual supplemental benefits with rolling-average annual supplemental benefits for the banks in the sub-sample, where the observation for each bank-year is obtained by dividing the CEO's total supplemental pensions to date by the years of credited services. The procedure would highlight persistent trends in plan benefits, but it is conservative in that it dampens the effects of uneven annual changes in the supplemental plans. The drawback to the approach, however, is that it attenuates the effects of more recent changes in the pension variable. The results (not tabulated for brevity) are similar to those based on annual CEO supplemental benefits; in particular, the coefficient on *After* is −0.246, and the coefficient on the interaction between *Stay* and *After* is 0.366, although, only marginally significant (*p-value* < 0.14). Overall, the multivariate results provide further evidence of a positive shift in supplemental pension benefits for bank CEOs that remained after their banks accepted the TARP funds and applicable compensation restrictions.

## 5. Conclusion

This paper studies the implications of TARP restrictions on executive compensation for firm performance and for top executives' career. We separate the sample of TARP recipients into two groups: *ceo\_resign* banks and *ceo\_stay* banks. By applying the difference-in-difference analysis, the results suggest that TARP recipients benefit from the TARP-induced CEO resignations. We find that the performance improvements in *ceo\_resign* banks are significantly higher after the CEOs exit the banks than *ceo\_stay* banks. These results still hold when we control for other factors affecting the firm's performance. We also find that the increase in performance improvement is most significant in the year following CEO resignation.

The study also explores potential explanations for the decision by some CEOs to remain in their roles despite the extensive TARP restrictions on compensation. In particular, it tests whether TARP recipients mitigate the wealth-reduction effects of TARP by substituting towards pension benefits that are less restricted under TARP. We find a significant increase in CEO's pension in post-TARP period for banks that did not experience CEO resignations during the TARP period. Further analysis on all banks without CEO resignations shows that TARP banks have significantly higher increase in pension benefits post 2009 than banks that chose to decline TARP funds. These results confirm the expectations that staying top executives in TARP banks accept a pay cut in the short-term because they expect supplemental arrangements – pension plans – to offer additional benefits.

The implication of regulatory interventions for executive compensation is important as banks face resource constraints and an expanding global economy. This study demonstrates the effect of regulatory intervention on both firm performance and on executive compensation. Contrary to concerns expressed by banks and business press that TARP would drain top talents, the evidence from this study strongly suggests that TARP is associated with performance improvement. We also find that TARP recipients use such alternative compensation arrangements as pension benefits to reduce the wealth-reduction effect for bank executives.

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<sup>18</sup> Most firms disclose only the aggregate value of nonqualified benefits and provide few details about the various components. The recipients of TARP fund may be particularly inclined to conceal details of their supplemental plans for fear of reprisals from the TARP administrator.

<sup>19</sup> As a robustness check, we include year fixed effects in Table 11. The results (omitted for brevity) show that the coefficient on *Stay* × *After* is positive, although insignificant at the conventional probability level. The weak statistical significance is likely due to the small sample size.



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