

# **Incentive Compensation, Accounting Discretion and Bank Capital**

---

**Timothy W. Koch,**

*University of South Carolina*

**Dan Waggoner , and Larry D. Wall**

*Federal Reserve Bank of Atlanta*

The views expressed here are those of the authors and not necessarily those of the Federal Reserve Bank of Atlanta, or the Federal Reserve System



# Overview: Big picture

---

- Financial crisis has sparked a sweeping review of bank supervision and regulation
- Goal is to move quickly to remedy a wide variety of perceived flaws in pre-crisis regulation
- These remedies are likely to have unintended consequences for each other
  - Some unintended consequences are likely to be supportive of other regulatory changes
  - Some are likely to weaken other changes
- This study looks at the unintended consequences of incentive compensation regulation on countercyclical capital policies

# Overview: Sketch of main idea

---

- Earnings management impacts banks ability to absorb losses without becoming distressed
- The direction and amount of earnings management depends upon incentives of senior bank managers (CEO and CFO)
- Recently issued bank incentive compensation guidelines have potential to change earnings management incentives
  - And with it banks' ability to absorb losses in downturns

# Overview: Major results

---

- Consistent with building countercyclical buffers
  - The part of incentive compensation (IC) guidelines on penalties for bad outcomes
  - IC guidelines calling for deferred bonuses subject to penalties
  - IC guidelines calling for less sensitivity to higher levels of performance
- Contrary to building countercyclical buffers
  - IC guidelines that encourage the payment of bonuses in the form of equity-linked instruments
- Earnings management tend to undercuts IC goals

# Outline

---

- Countercyclical capital
- IC Guidelines
- Accounting discretion
  - Theory of earnings management
  - Empirical analysis of banks
- Model of accounting based IC
- Model of stock based compensation
- Conclusion

# Countercyclical capital

---

- Countercyclical capital intended to help banks
  - Remain solvent and lending during bad times
  - Dampen credit growth in good times
- Ways to build countercyclical buffer
  1. Direct via capital requirements
  2. Indirect by countercyclical loan loss provisioning
  3. Earnings management designed to smooth earnings
    - Reduce reported earnings in good times to report higher earnings in bad times

# Incentive compensation: Overview

- Widespread belief that bad IC policies were partially responsible for the crisis
  - Institute for International Finance (2009) found 98% of the large international banks in a survey agreed that IC was a factor in the financial crisis of 2007 and 2008
- Financial Stability Board guidelines
- Federal Reserve issued preliminary guidelines in 2009 and
  - With final interagency banking guidelines issued in 2010 and 2011
- Dodd-Frank Act expands similar requirements to a variety of other financial firms

# IC: Existing structures

---

- Murphy (1998, 2001) had access to CEO contracts across variety of industries including finance
- CEO compensation included salary and IC
- Almost all companies paid IC based in part on accounting earnings
  - Bonuses with performance thresholds and caps on total bonus most common
  - Penalties for underperformance not mentioned
- Stock and option grants also common
  - No evidence the grants were determined by performance



# IC: U.S. banking guidelines

---

- U.S. guidelines based on principal that IC should provide balanced risk taking incentives
  - Focus on determinants of bonus not on size
  - Departure from prior practice that often relied on risk controls and not at all on IC
  - Guidelines rather than rules reflecting
    - Differences in employee risk taking
    - Limited theory and empirical analysis
  - For all employees, it encourages reduced sensitivity of IC to short-term performance at higher levels of performance

# IC: U.S. senior banking management guidelines

- U.S. guidelines based on principal that IC should provide balanced risk taking incentives
- Risk adjusting returns used in IC calculations not sufficient for senior management
- Guidelines recommend
  - IC be spread over several years or performance be measured over several years
  - Balance more likely if compensation is provided in equity based instruments
  - Substantial portion of IC is deferred
  - And number of instruments actually paid depends upon the bank's performance
    - That is payments subject to malus

# Earnings management theory

---

- IC intended to motivate managers to take hidden actions that will increase shareholder value
- Crocker and Slemrod (2007) suggest it is not possible to design a contract that both incents managers to maximize shareholder value and incents them to report profits honestly

# Earnings management theory

---

- Degeorge, Patel and Zeckhauser (1999) show that fixed bonuses generally induce CEOs to smooth income in a two period model
- Healy (1985) considers fixed bonus at the lower threshold, variable bonus above this threshold with cap on bonus at upper threshold
  - Results similar to that of a single threshold and fixed bonus except target upper threshold in good earnings states

# Earnings management theory

- Fudenberg and Tirole (1995)
  - It considers a large fixed penalty (firing)
  - Creates incentive to smooth earnings
- Earnings management to increase stock prices considered in several papers
  - Stein (1989) develops a model in which management takes as given investors' conjectures about the extent of earnings management.
  - In this setting, earnings manipulation produces a one-for-one increase in investors' perception of the firm's latent earnings in the steady state.

# Earnings management in banking

- Wall and Koch (2000) survey six studies of earnings management, especially through loan losses
  - Studies consistently found the use of discretion was related to bank capital
  - Inconsistent evidence on use of discretion to manage earnings per se
- Adams, Carow and Perry (2009) find that earnings were managed down to reduce cost of new shares in mutual savings bank IPOs
- Additional evidence of earnings management from El Sood's (2012) analysis of a sample of U.S. bank holding companies and Bushman and Williams' (2012) cross-country analysis

# Earnings management in banking

---

- Dechow, Myers and Shakespeare (2010) and Fietcher and Meyer (2010) find evidence of the management of reported fair values
  - Barth and Taylor (2010) concur that DMS found evidence of earnings management but question whether it was due to manipulation of fair values

# Model – IC based on accounting earnings

## Overview

- After observing  $t=1$  earnings, the maximum amount of accounting discretion is revealed

$$RE_1 = LE_1 + DA$$

- Discretionary adjustment from  $t=1$  reversed out at  $t=2$  that is

$$RE_2 = LE_2 - DA$$

- With  $DA$  constrained by  $MAXDA$

$$-MAXDA \leq DA \leq MAXDA$$



# Model – IC based on accounting earnings

## Overview

- Salary fixed at zero without loss of generality
- Bonus function at time 1 is

$$BP(RE_t) = FB + vb(RE_t - TE_t) \text{ if } RE_t \geq TE_t,$$

and

$$BP(RE_t) = -vp(TE_t - RE_t) \quad \text{otherwise,}$$

with

$$FB, vb, vp \geq 0,$$

where

$FB$  = fixed bonus paid at time,

$vb$  = variable bonus

$vp$  = variable penalty rate

# Model – IC based on accounting earnings

## Overview

- With  $TLE = TE_2 + DA$
- Bonus function at time 2

$$E(ME) = BP(RE_1) - \frac{1}{1+r} \int_{-\infty}^{TLE} v p(RE_2 - TE_2) p(LE_2) dLE_2$$
$$+ \frac{1}{1+r} \int_{TLE}^{\infty} (FB + vb(RE_2 - TE_2)) p(LE_2) dLE_2$$

# Model – IC based on accounting earnings

## Positive variable penalty

- Model with
  - Positive variable penalty & finite discount rate
  - Zero fixed bonus & variable bonus
- Minimize penalty by targeting reported earnings equal to threshold at  $t=1$ 
  - If latent earnings are below the threshold use discretion to move to the threshold
    - But no higher to reduce  $t=2$  hit on earnings
  - If latent earnings are above the threshold use discretion save earnings for  $t=2$ 
    - Use maximum discretion if sufficiently far above the threshold

# Model – IC based on accounting earnings

## Positive fixed bonus

- Model with
  - Positive fixed bonus & finite discount rate
  - Zero variable penalty & variable bonus
- Similar to variable penalty
  - Target threshold from above and below
  - Exception occurs if threshold is unreachable from below
    - If fixed bonus is not attainable this period, then use discretion to minimize  $t=1$  reported earnings
    - Which maximizes  $t=2$  reported earnings
- Similar model and same results as Degeorge, Patel and Zeckhauser (1999)

# Model – IC based on accounting earnings

## Positive variable bonus

- Model with
  - Positive variable bonus & finite discount rate
  - Zero variable penalty & fixed bonus
- Use maximum discretion to boost reported earnings if above  $t=1$  threshold
  - Saving to boost  $t=2$  bonus subject to discount rate and possibility of low  $t=2$  latent earnings
- Use maximum discretion to reduce earnings if sufficiently far below  $t=1$  threshold
  - Save for time  $t=2$
- Below  $t=1$  threshold then compare bonus given maximum increase in reported earnings with bonus given max decrease

# Model – IC based on accounting earnings

## Infinite discount rate

---

- Model with
  - Positive variable penalty, fixed and variable bonus
  - Infinite discount rate
    - Equivalent to manager retiring after  $t=1$  with no further connections to the bank
- Manager's incentive to use maximum discretion to boost earnings
  - Benefit of higher bonus and/or lower penalty
  - No cost in the following period

# Model – IC based on accounting earnings

## Model implications of guidelines for capital

- Move towards threshold generally consistent countercyclical capital **subject to level of threshold**
- Guideline call for malus (variable penalty) supports countercyclical capital
  - Likely biggest impact given malus was rare
- Guideline call for deferred comp subject to malus supports countercyclical capital
  - Impact depends on CEO's actions in last year which we find might be large

# Model – IC based on accounting earnings

## Model implications of guidelines for capital

- Guidelines call for cap on bonuses supports countercyclical capital
  - Uncapped resulted in maximum boost to earnings in good times
  - Impact depends on extent to which bank senior managers had uncapped bonuses
- Earnings management reduces the extent to which variability in latent earnings is reflected in reported earnings
  - Which will tend to weaken the effectiveness of IC guidelines in reducing risk taking



# Model – IC through stock-based compensation

## Overview

---

- Stock based similar to accounting based IC
- Differences
  - Earnings follow a random walk with normally distributed innovations
  - Maximum accounting discretion at  $t=1$  is normally distributed
  - Three period model

# Model – IC through stock-based compensation

## Overview

---

- Differences (continued)
  - Bank is liquidated at  $t=3$  with payout equal to sum of latent earnings at  $t=1, 2$  and  $3$
  - Investors know distribution of latent earnings and accounting discretion but not realizations
  - Investors can observe reported earnings at  $t=1$  and  $t=2$
  - Investors correctly infer
    - The direction of  $t=1$  discretion (boost or lower earnings)
    - The manager uses maximum discretion

# Model – IC through stock-based compensation Analysis

- Manager decides to sell stock at time  $t=1$  or  $t=2$ 
  - Manager's selling intentions are common knowledge (implication of other assumptions)
- Investors infer actual latent earnings at  $t=1$  and  $t=2$ 
  - Use reported earnings and distributions of latent earnings and accounting discretion
  - Rationally attribute part of an increase in earnings to accounting discretion and part to latent earnings
    - Precise inference depends on relative variability of latent earnings and accounting discretion

# Model – IC through stock-based compensation Analysis

- If manager is to sell at time  $t=1$ 
  - Use maximum discretion to boost earnings
  - Part of any increase goes to boosting investors estimate of latent earnings at  $t=1$
  - Higher  $t=1$  estimated latent earnings implies higher estimates for  $t=2$
  - And also for  $t=3$  as earnings are assumed to follow a random walk
  - Reversal at  $t=2$  has no impact as stock has already been sold

# Model – IC through stock-based compensation Analysis

- If manager is to sell at time  $t=2$ 
  - Use maximum discretion to reduce  $t=1$  reported earnings
    - Thereby boosting  $t=2$  reported earnings
  - Investors correctly infer (calculate) the sum of  $t=1$  plus  $t=2$  latent earnings
  - But use of discretion results in higher estimate of  $t=2$  latent earnings
    - Implying higher expected  $t=3$  latent earnings and higher stock value

# Model – IC through stock-based compensation Analysis

- Last issue is when will manager sell
- Answer comes if we weaken the random walk assumption to allow some mean reversion
  - Manager is likely to sell when stock price is unusually high
  - Which is likely to happen when latent earnings draw is especially good
  - Implication is that manager would use accounting discretion to boost earnings when earnings appear to be at cyclical peak
    - Result is pro-cyclical earnings management to boost stock value

# Model – IC through stock-based compensation

## Implications for capital

- IC guidelines call for deferred compensation in equity linked instruments
- Managers already care about their own shareholdings and those of other participants in corporate governance
  - The extent to which the IC guidelines will change management behavior is open question
- But if this part of the guidelines changes management behavior towards risk
  - Then it will could also encourage pro-cyclical moves in bank capital

# Conclusion

---

- Multiple, expedited changes in regulation are likely to have unintended consequences
- One place where unintended consequences occur is between IC guidelines and countercyclical capital buffers
- Accounting based parts of IC likely to encourage countercyclical buffers
  - Likely largest impact from malus
- Equity based parts of IC may encourage procyclical buffers
  - Change due to IC is unclear
- Earnings management works against goals of IC guidelines