Incentive Compensation, Accounting Discretion and Bank Capital

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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
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

\[
BP(RE_t) = FB + vb(RE_t - TE_t) \quad \text{if } RE_t \geq TE_t \\
\text{and} \\
BP(RE_t) = -vp(TE_t - RE_t) \quad \text{otherwise,}
\]

with
\[
FB, \ vb, \ vp \geq 0,
\]
where
\[
FB = \text{fixed bonus paid at time,} \\
vb = \text{variable bonus} \\
vp = \text{variable penalty rate}
\]
Model – IC based on accounting earnings

Overview

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

\[
E(ME) = BP(RE_1) - \frac{1}{1 + \gamma} \int_{-\infty}^{TLE} \nu p(RE_2 - TE_2)p(LE_2) dLE_2
\]

\[
+ \frac{1}{1 + \gamma} \int_{TLE}^{\infty} \left( FB + \nu b(RE_2 - TE_2) \right) p(LE_2) dLE_2
\]
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 pro-cyclical buffers.
  - Change due to IC is unclear.
- Earnings management works against goals of IC guidelines.