

Capital Requirements and Earnings Management in Banks

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Should Risk Management be Based on Accounting Numbers and Principles ?

- ▶ Bank's capital is defined in accounting terms
- ▶ Book value of equity can deviate significantly from its market value
- ▶ Risky assets are usually measured by book values (derivatives being the exception)
- ▶ Accounting numbers can hide (positive and negative) values.
- ▶ Earnings management can be used for risk management purposes.

Why Should Banks Manage Earnings ?

- ▶ Capital Requirement
- ▶ Analysts' Expectations
 - Return on Assets / Investments
 - Growth Rate
- ▶ Owners / Managers Conflict (Agency Problem)

Methods for Managing Earnings

- ▶ Big Bath Charges
- ▶ Creative Acquisition Accounting
- ▶ Cookie– Jar Reserves
- ▶ Materiality
- ▶ Revenue Recognition

Accounting Principles

- ▶ Conservative Accounting vs. Transparency
- ▶ Book Value vs. Fair Value

Degeorge, Patel and Zeckhauser (1999)

Introduce 3 behavioral thresholds for earnings management:

- ▶ Report positive earnings
- ▶ Sustain recent performance
- ▶ Meet analysts' expectations

Over the last decade, leading banks were expected to exhibit the following performance:

- ▶ Return on equity of 15-20%
- ▶ Sustained earnings, growth of earnings of 5-10%
- ▶ Minimum equity of 8-12% of risky assets.
- ▶ Maintain credit rating

Why Should Banks Own Real Assets ?

- ▶ Special Skills
- ▶ Special Information
- ▶ Economies of Scale
- ▶ Risk Diversification
- ▶ Earnings Management

A Bank faces the dilemma:
Realizing profits today can hurt a bank next period:

- ▶ Hard to sustain excellent performance
- ▶ Hard to achieve growth of earnings
- ▶ Increased equity base requires larger future profits (Unless paid out as dividends).

The Model

▶ Objective Function

- Capital Requirements
- Minimal Return on Equity (e.g. 10%)
- Minimize Penalty on Missing Objectives

$$RP = b_1 \text{Max}(\text{RET}-10\%,0) + b_2 \text{Min}(\text{RET}-10\%,0)$$

Constraints

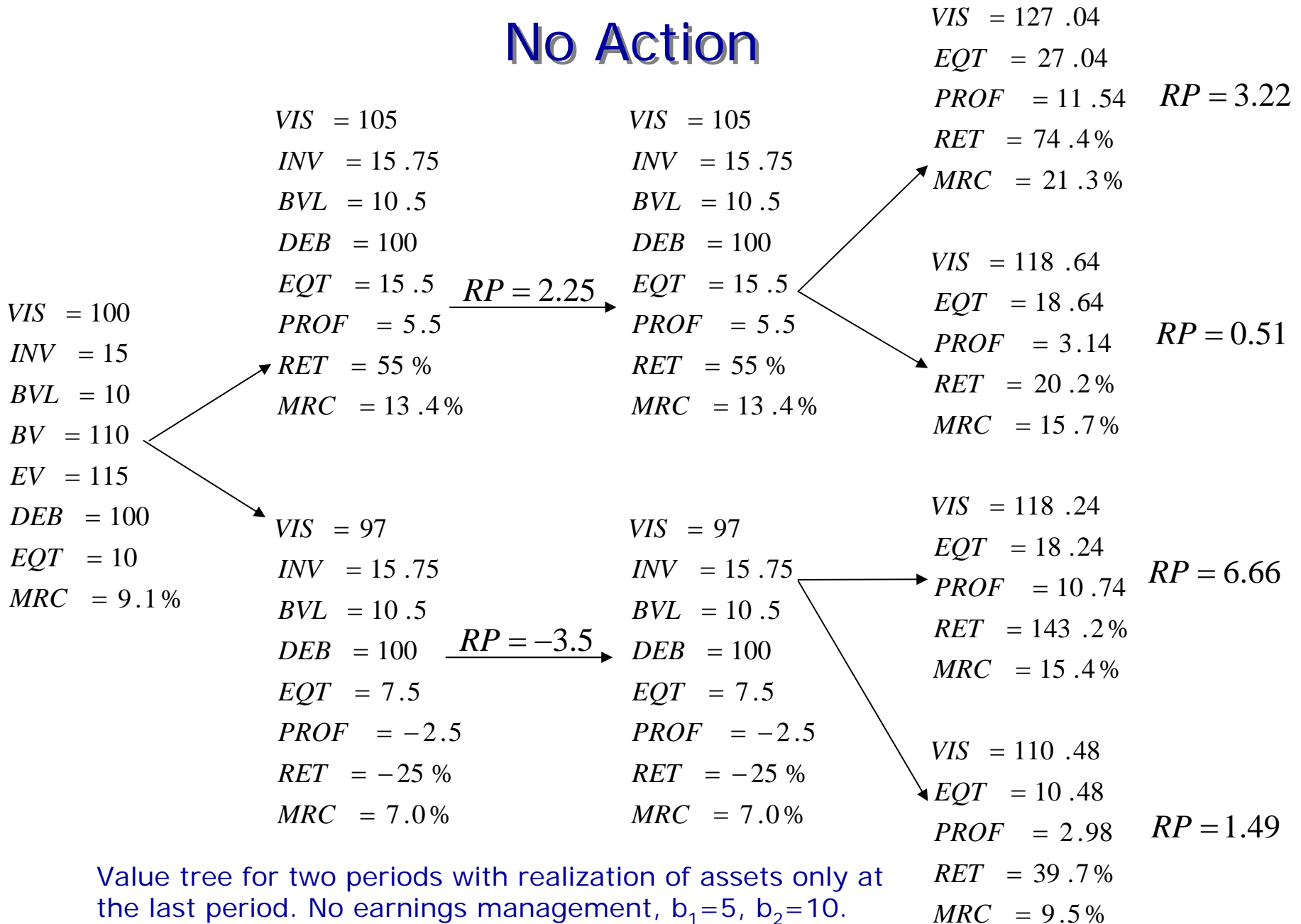
▶ $RET = PROF/EQT \geq 10\%$

▶ Capital Adequacy requirement is 8%
 $MRC = EQT/(EQT+DEB) \geq 8\%$

The Model – A Numerical Example

- ▶ Explicit Asset , A , is binomially distributed with $U = 1.1$, $D = 1.02$ ($r_f = 5\%$)
- ▶ Hidden asset , B , has a certain return of 5% (or less)
- ▶ Initial value of A is $VIS = 100$
- ▶ Initial value of B is 15 in market value terms, $INV = 15$
in book value terms 10 $BVL = 10$
- ▶ Asset B can be sold (fully or partially) for its market value
- ▶ 2 period model

No Action



Simple strategy

$VIS = 127.04$
 $EQT = 27.04$
 $PROF = 11.54$ $RP = 3.22$
 $RET = 74.4\%$
 $MRC = 21.3\%$

$VIS = 105$
 $INV = 15.75$
 $BVL = 10.5$
 $DEB = 100$
 $EQT = 15.5$
 $PROF = 5.5$
 $RET = 55\%$
 $MRC = 13.4\%$

$RP = 2.25$

$VIS = 105$
 $INV = 15.75$
 $BVL = 10.5$
 $DEB = 100$
 $EQT = 15.5$
 $PROF = 5.5$
 $RET = 55\%$
 $MRC = 13.4\%$

$VIS = 118.64$
 $EQT = 18.64$ $RP = 0.51$
 $PROF = 3.14$
 $RET = 20.2\%$
 $MRC = 15.7\%$

$VIS = 100$
 $INV = 15$
 $BVL = 10$
 $BV = 110$
 $EV = 115$
 $DEB = 100$
 $EQT = 10$
 $MRC = 9.1\%$

$VIS = 97$
 $INV = 15.75$
 $BVL = 10.5$
 $DEB = 100$
 $EQT = 7.5$
 $PROF = -2.5$
 $RET = -25\%$
 $MRC = 7.0\%$

$RP = -3.5$

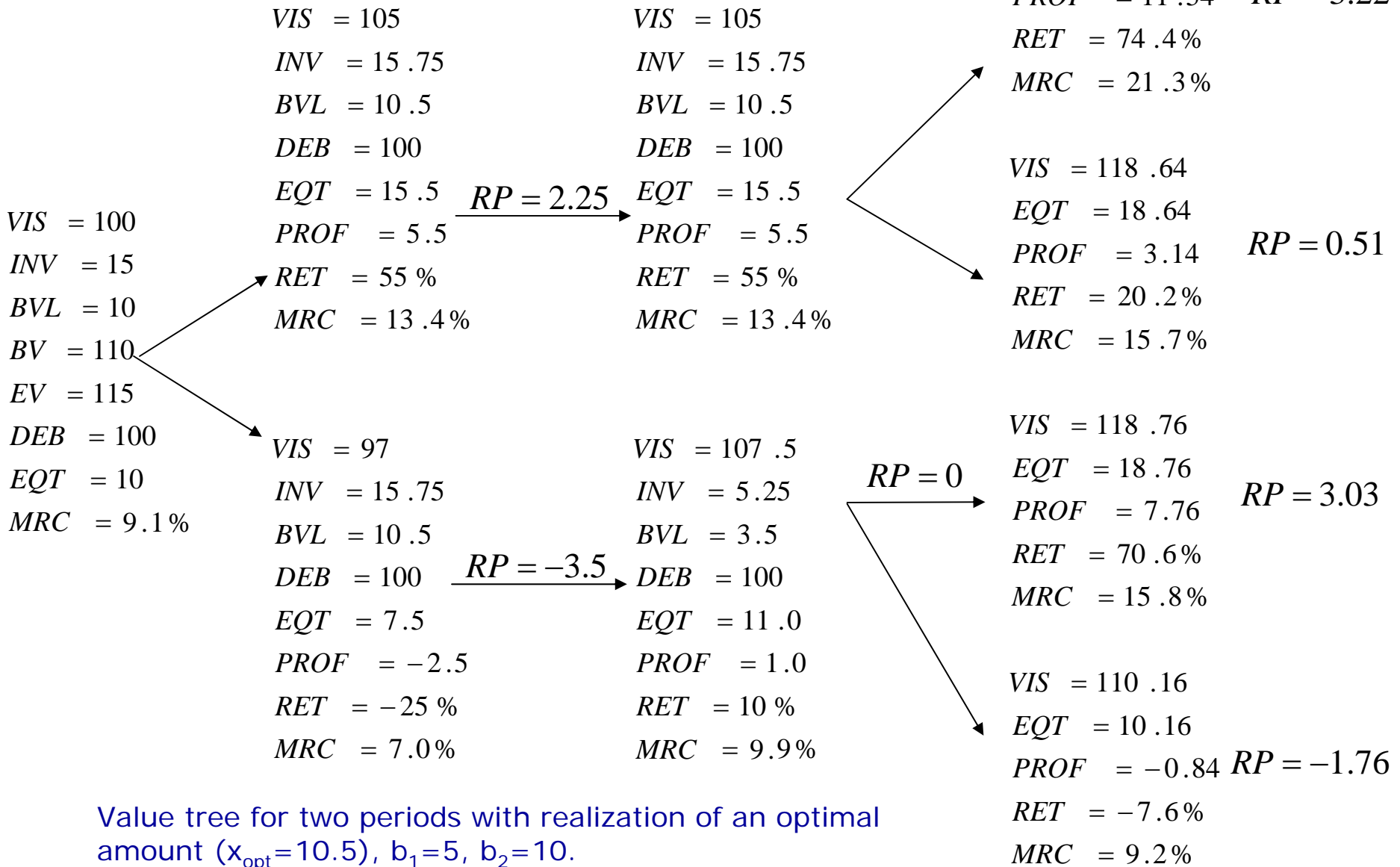
$VIS = 100.59$
 $INV = 12.16$
 $BVL = 8.11$
 $DEB = 100$
 $EQT = 8.7$
 $PROF = -1.3$
 $RET = -13\%$
 $MRC = 8.0\%$

$RP = -2.3$
 $VIS = 118.42$
 $EQT = 18.42$ $RP = 5.09$
 $PROF = 9.72$
 $RET = 111.8\%$
 $MRC = 15.6\%$

$VIS = 110.37$
 $EQT = 10.37$ $RP = 0.46$
 $PROF = 1.67$
 $RET = 19.3\%$
 $MRC = 9.4\%$

Value tree for two periods with realization of assets in order to fulfill the minimal capital requirement, $b_1=5$, $b_2=10$.

Smart strategy



Reward/Penalty

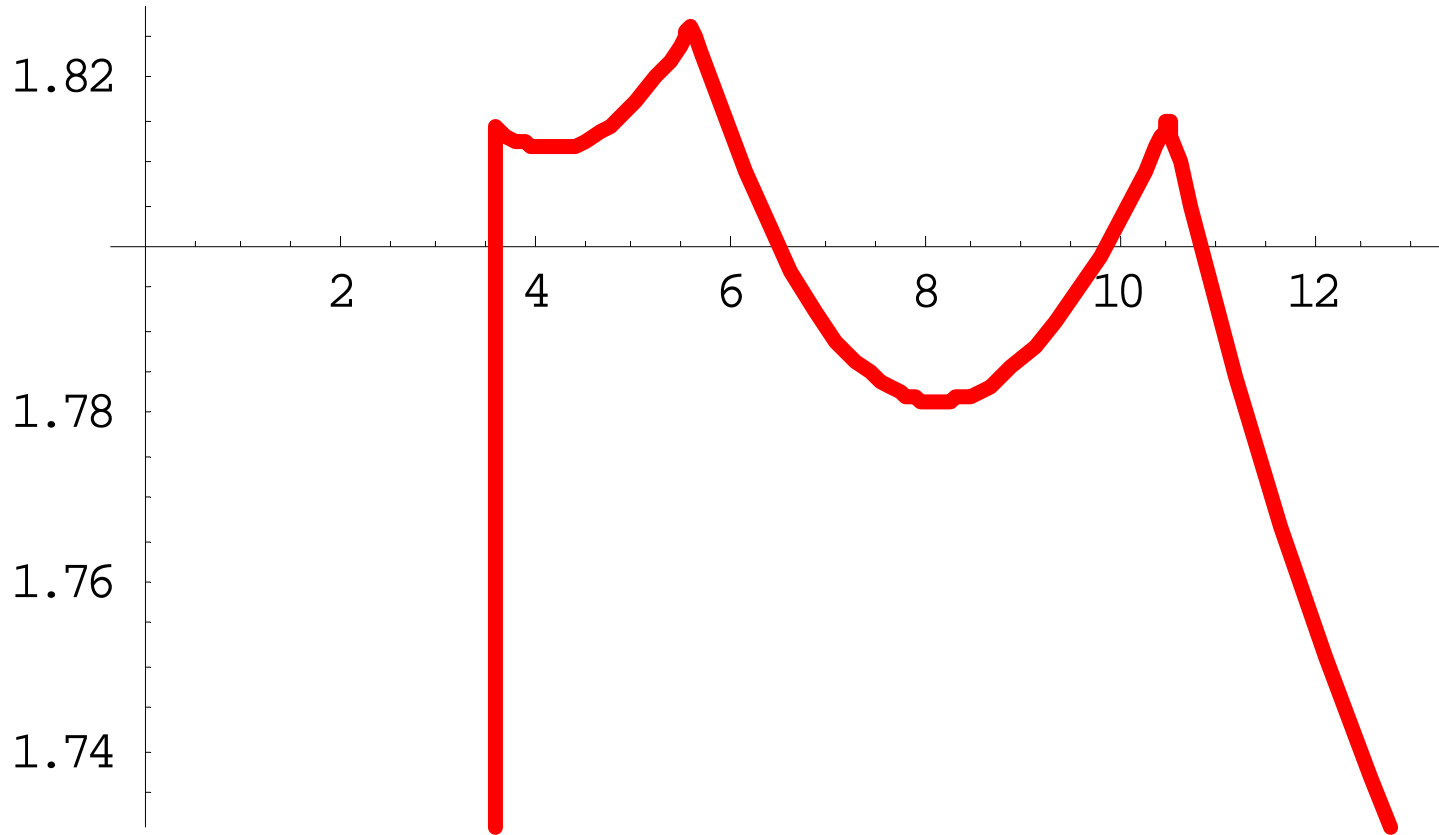


Figure 4. Penalty ($b_1=6.2$, $b_2=10$) as a function of realized hidden asset ($x_{\text{opt}}=5.6156$), $r_{\text{INV}}=1.05$.

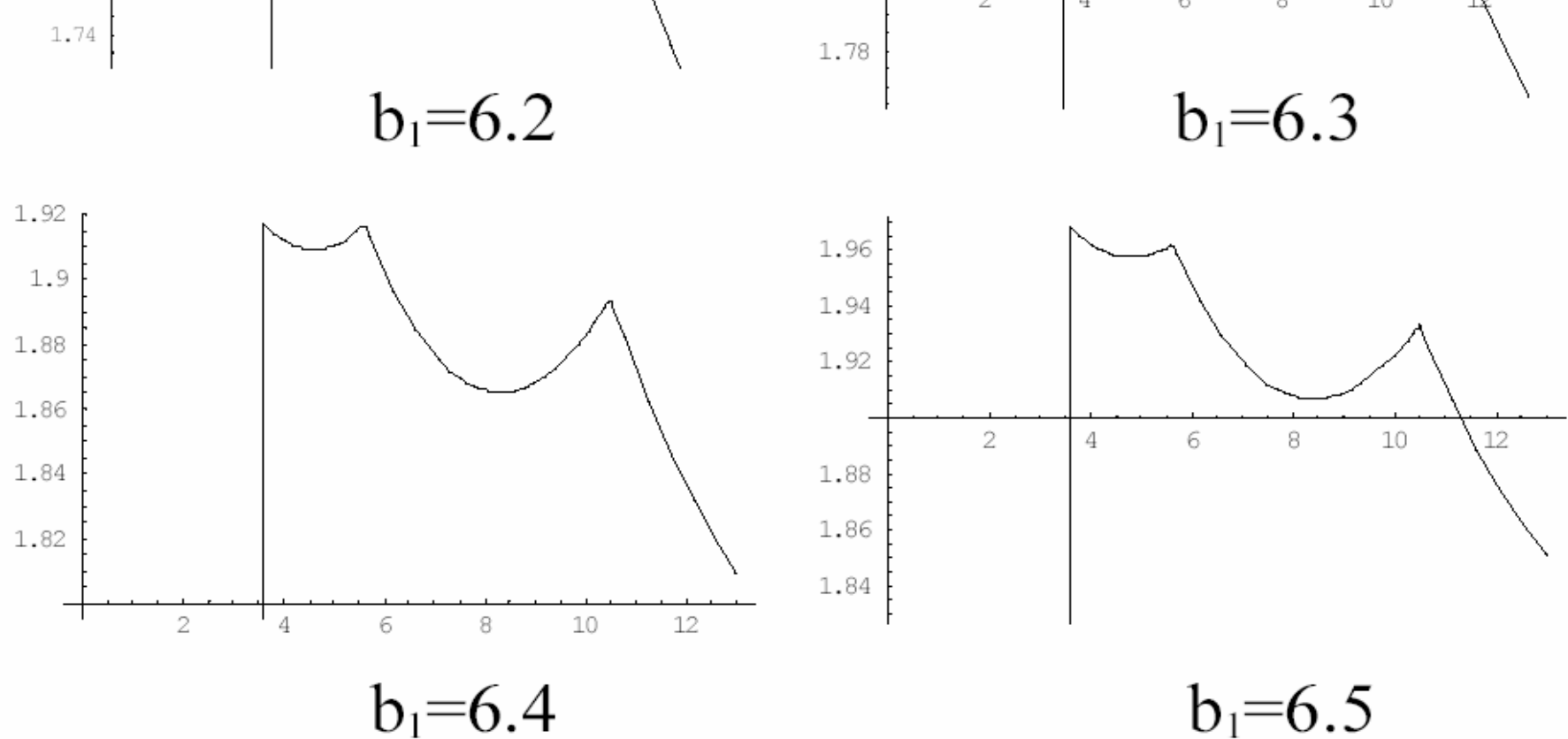


Figure 1. Reward/penalty function (vertical axis) for different levels of realization of invisible asset at $t=1$ (horizontal axis), for different ratios of reward b_1 to penalty $b_2=10$, when riskless rate of return on invisible asset is 5%.

Reward/Penalty

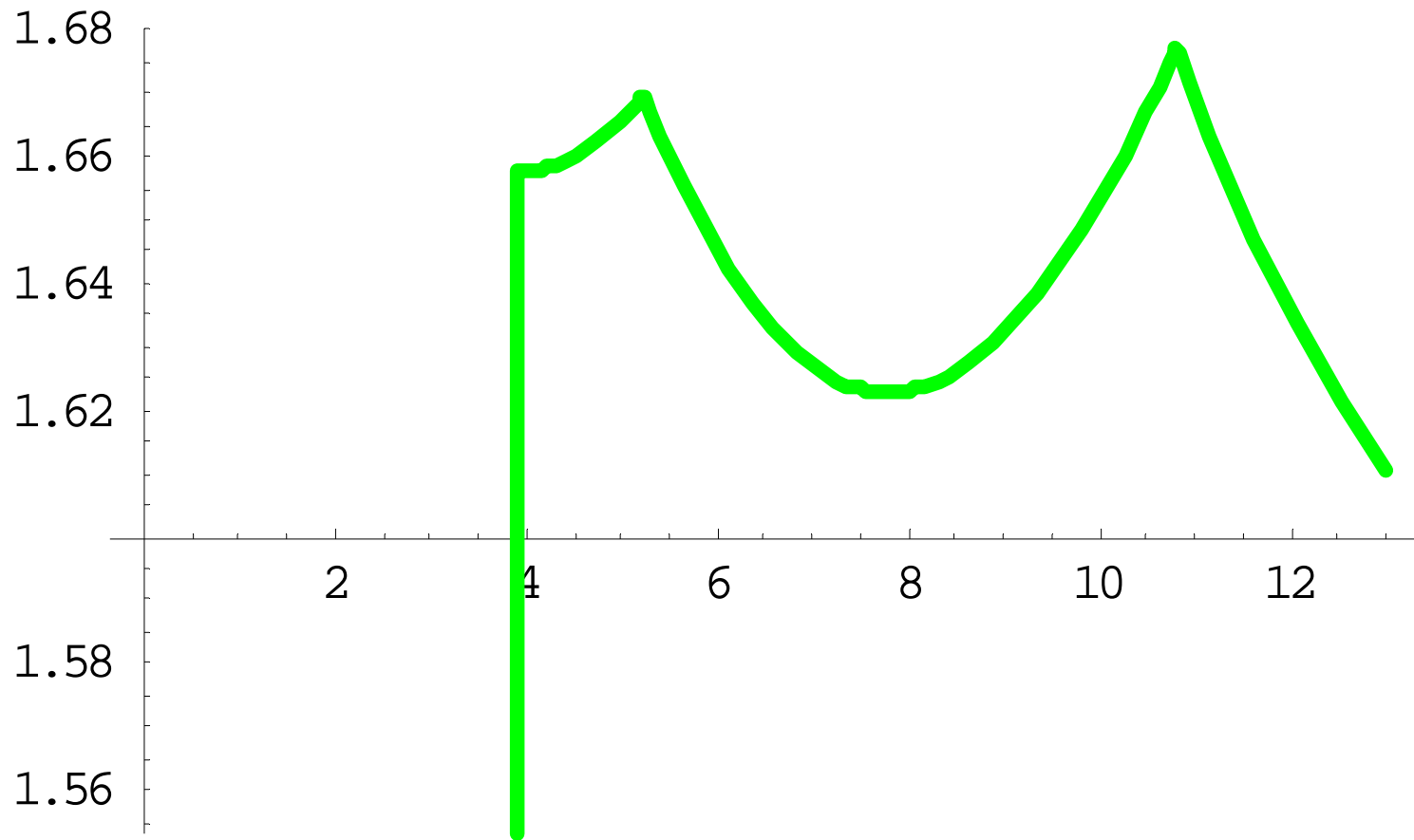
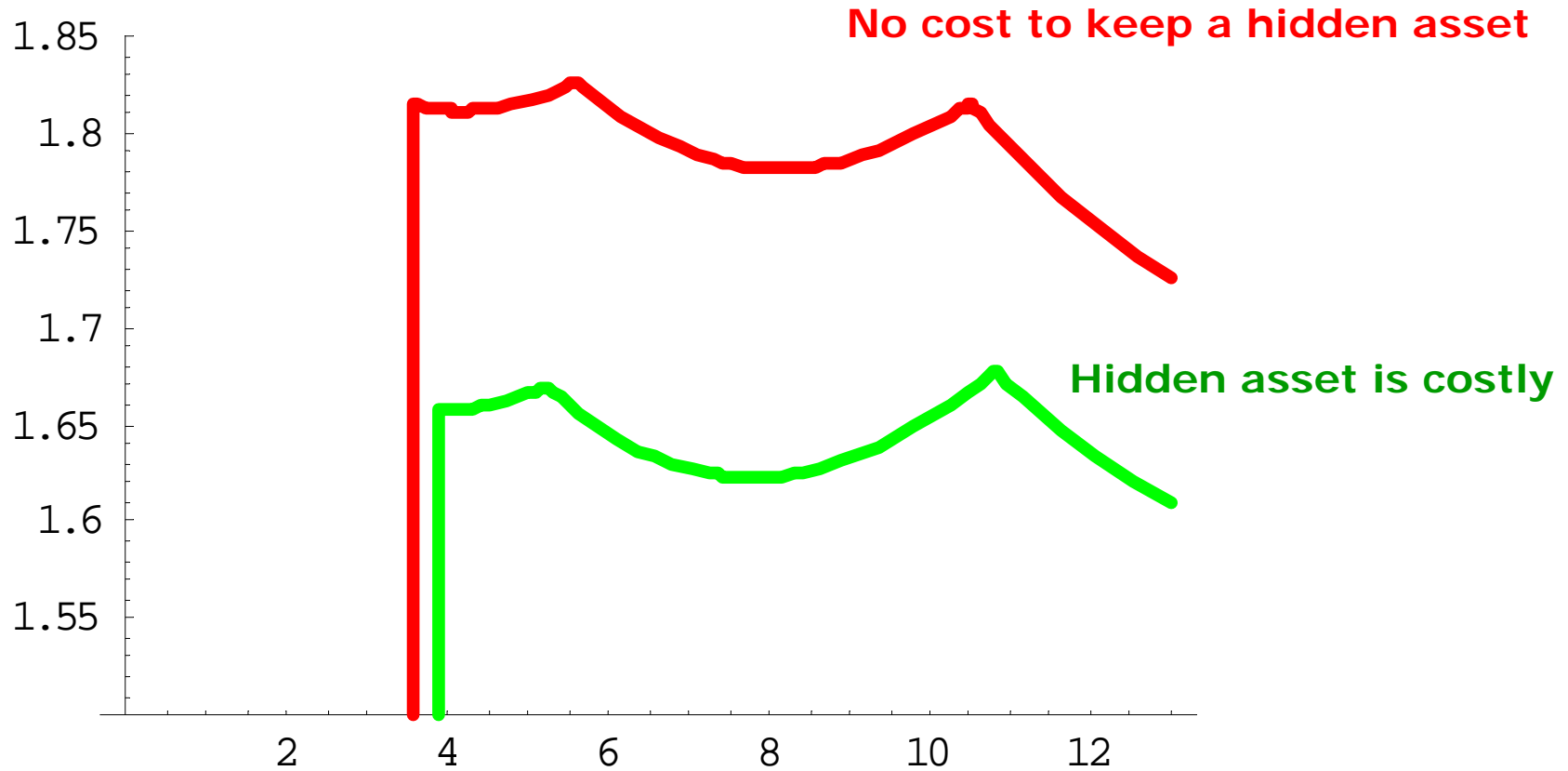


Figure 4. Penalty ($b_1=6.2$, $b_2=10$) as a function of realized hidden asset ($x_{\text{opt}}=10.8$), $r_{\text{INV}}=1.04$.

Reward/Penalty comparison



liquidation

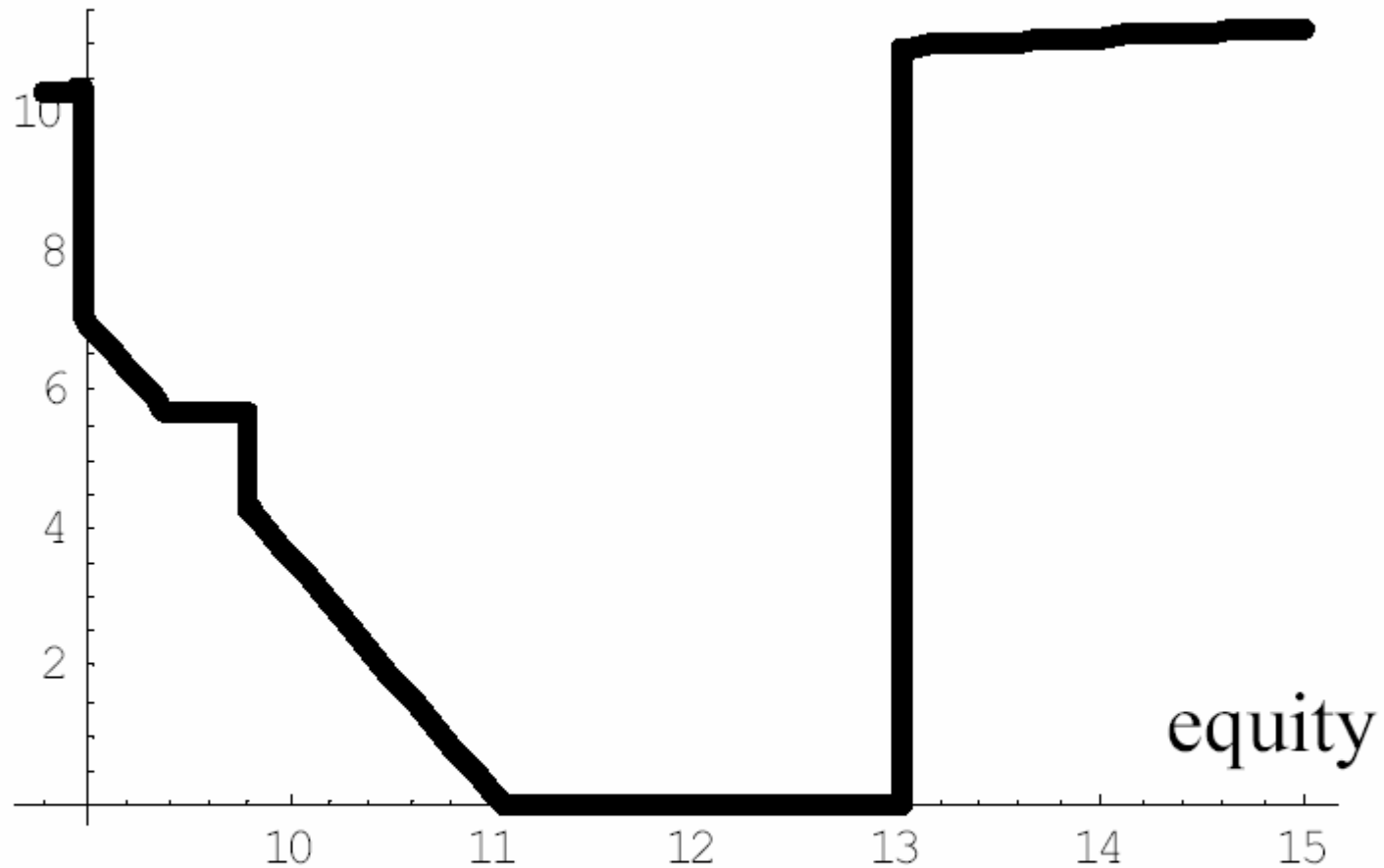
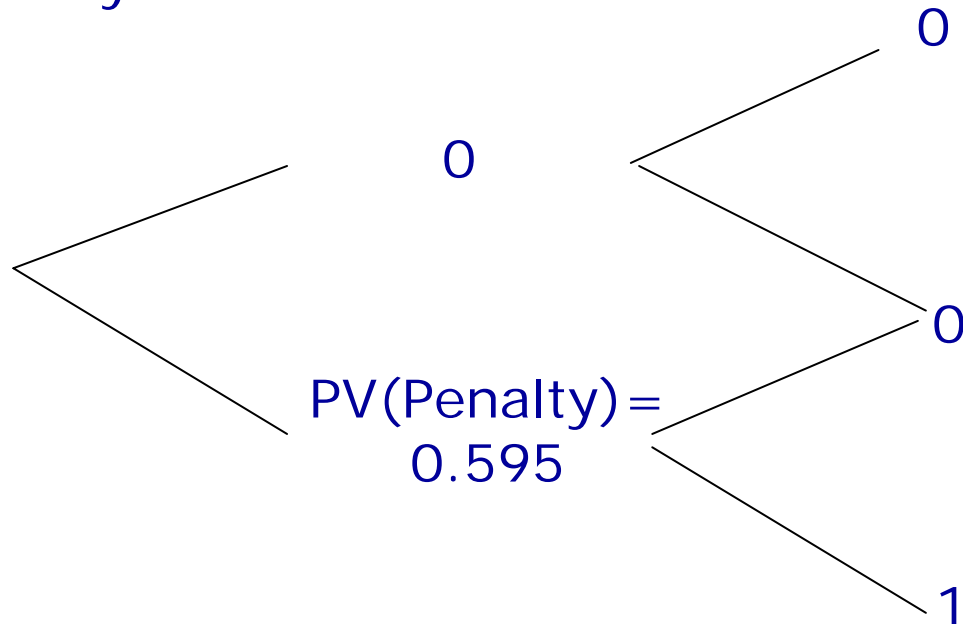


Figure 3. The optimal liquidation at period one of invisible asset as a function of bank's equity.

Is \$1 of penalty at time 1 equivalent to potential penalty at time 2 ? No.



Time 0

1

2

$$PV_1(\text{TIME 2 PENALTY AT 1}) = \frac{1}{R} \left(\frac{V-R}{V-D} \right) = \frac{1}{1.05} \left(\frac{1.1-1.05}{1.1-1.02} \right) = 0.595$$

Conclusions

- ▶ Asset management and liquidation policy can be very effective tools for earnings management.
- ▶ Analytical solutions for the multi-period case can be quite messy.
- ▶ Optimal policy depends on the structure of penalties
- ▶ Missing the target today can be much more costly than missing it next period.
- ▶ But, Missing the target today can reduce future targets
(Which helps to reduce future penalties...)