Agency Conflicts, Prudential Regulation, and Marking to Market.

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Prepared for the 2011 C.R.E.D.I.T. Conference

September 2011

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- Financial crisis—role of fair value accounting—actively debated

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  - regulatory capital requirements—prevent inefficient choices or continuation of bad projects

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  - market prices only discipline insiders if price signals reflect fundamentals
  - assets/liabilities traded in relatively frictionless, competitive markets
  - market prices along with regulatory capital requirements could induce myopic behavior—prevent selection of efficient, long-term projects.
- Central tradeoff—FV accounting could *simultaneously* mitigate inefficient choices of bad projects, but also hamper the choices of good ones—not been theoretically formalized.

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- What are the optimal choices of accounting regime and prudential capital requirements?

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- Asset substitution and under-investment work in opposing directions—increase in one mitigates the other
- Tradeoff between risk-shifting and under-investment especially pronounced at high leverage levels–typical of financial institutions

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- Important to choose appropriate accounting regime *and* tailor solvency constraint to the characteristics of the institution.

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- High leverage levels and prudential regulation are central to our theory

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- Project quality choice *costly*

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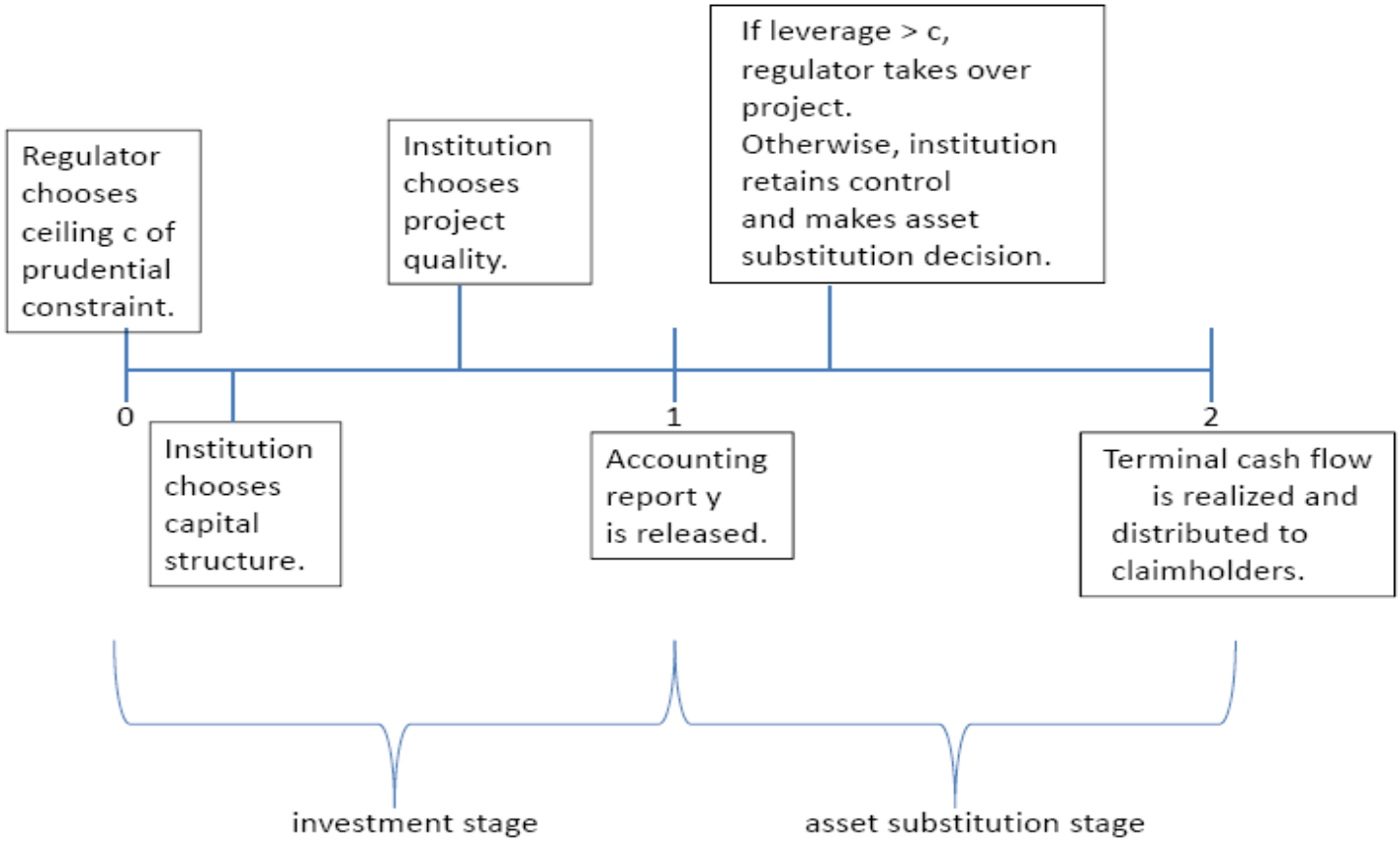
- Regulator chooses ex post efficient continuation strategy—no asset substitution


Regulator chooses ceiling c of prudential constraint.
Institution chooses project quality.
If leverage > c, regulator takes over project. Otherwise, institution retains control and makes asset substitution decision.
0
Institution chooses capital structure.
1
Accounting report y is released.
2
Terminal cash flow is realized and distributed to claimholders.
investment stage
asset substitution stage

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  - optimal choice of accounting regime

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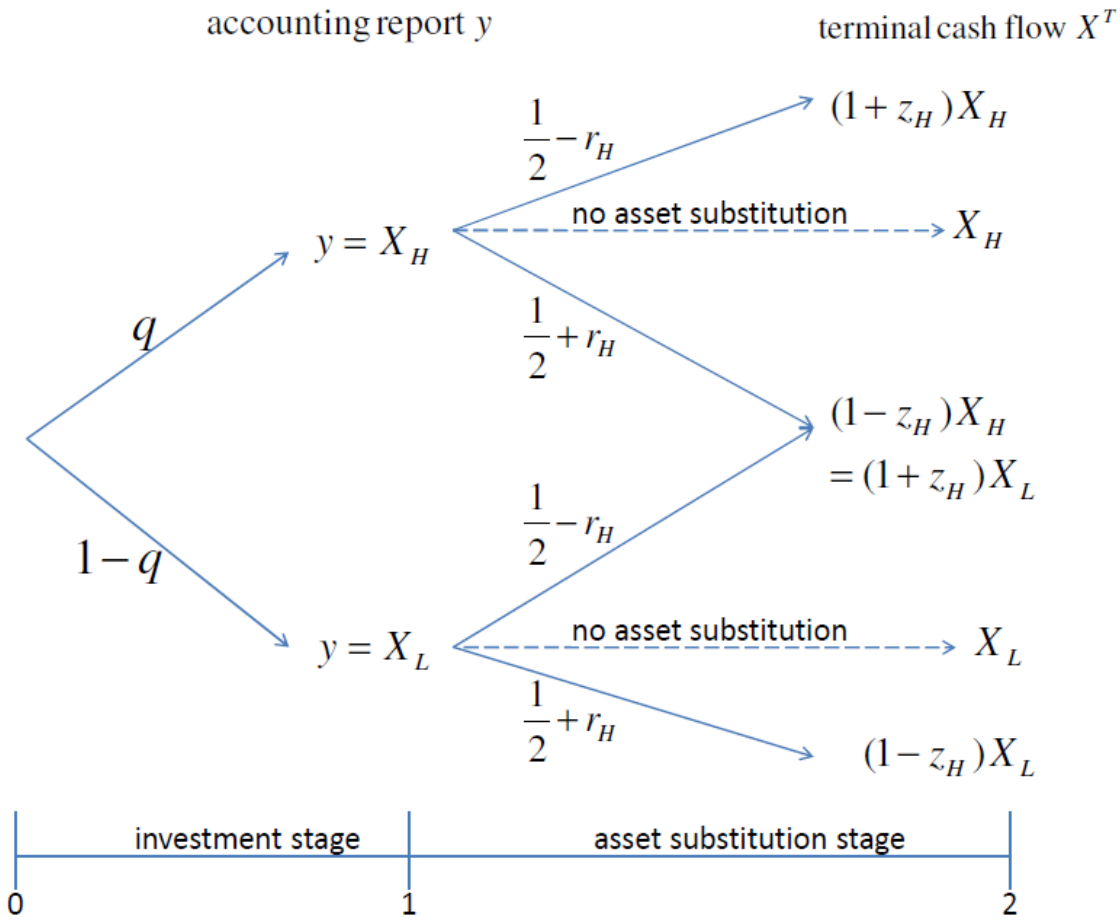
- Debt due at date 2—determined by face value M

Project Payoffs



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- Given $y = X_i$, terminal payoff, X_{ij}^T, takes values $(1 + z_j)X_i$ or $(1 - z_j)X_i$, where $0 \leq r_L < r_H \leq \frac{1}{2}$.

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- $z_j \in \{z_L, z_H\}$ where $0 \leq z_L < z_H \leq 1$—degree to which r_j alters terminal payoff.

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$$\frac{D_0}{A_0} \leq c^{HC} \tag{2}$$

at date $t = 0$ *and* the intermediate date $t = 1$.

Continuation and Transfer of Control

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- If constraint is violated—transfer of control to regulator
- Regulator closely monitors institution—ensures efficient continuation strategy—no asset substitution—chosen in second period

Historical Cost Regime

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Asset Substitution in HC Regime

Proposition (Asset Substitution in HC Regime)

Under the historical cost regime, shareholders choose asset substitution if and only if the maturity value M of debt is sufficiently high, that is, $M > c_0 y$, where $c_0 \equiv 1 - \frac{\frac{1}{2} - r_H}{\frac{1}{2} + r_H} z_H$.

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- For high leverage levels, asset substitution likely in "good" and "bad" states

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- Because enhancing project quality is expensive, shareholders under-invest in project quality

Asset Substitution and Under-Investment

Corollary (Asset Substitution and Underinvestment in the HC Regime)

If r_H decreases and/or z_H increases (i) the threshold level of the debt face value above which asset substitution occurs decreases for any value of the intermediate signal y; (ii) for given k, the threshold level of the debt face value above which the low project quality is chosen increases; and (iii) the threshold level k^* in Proposition 2 increases.

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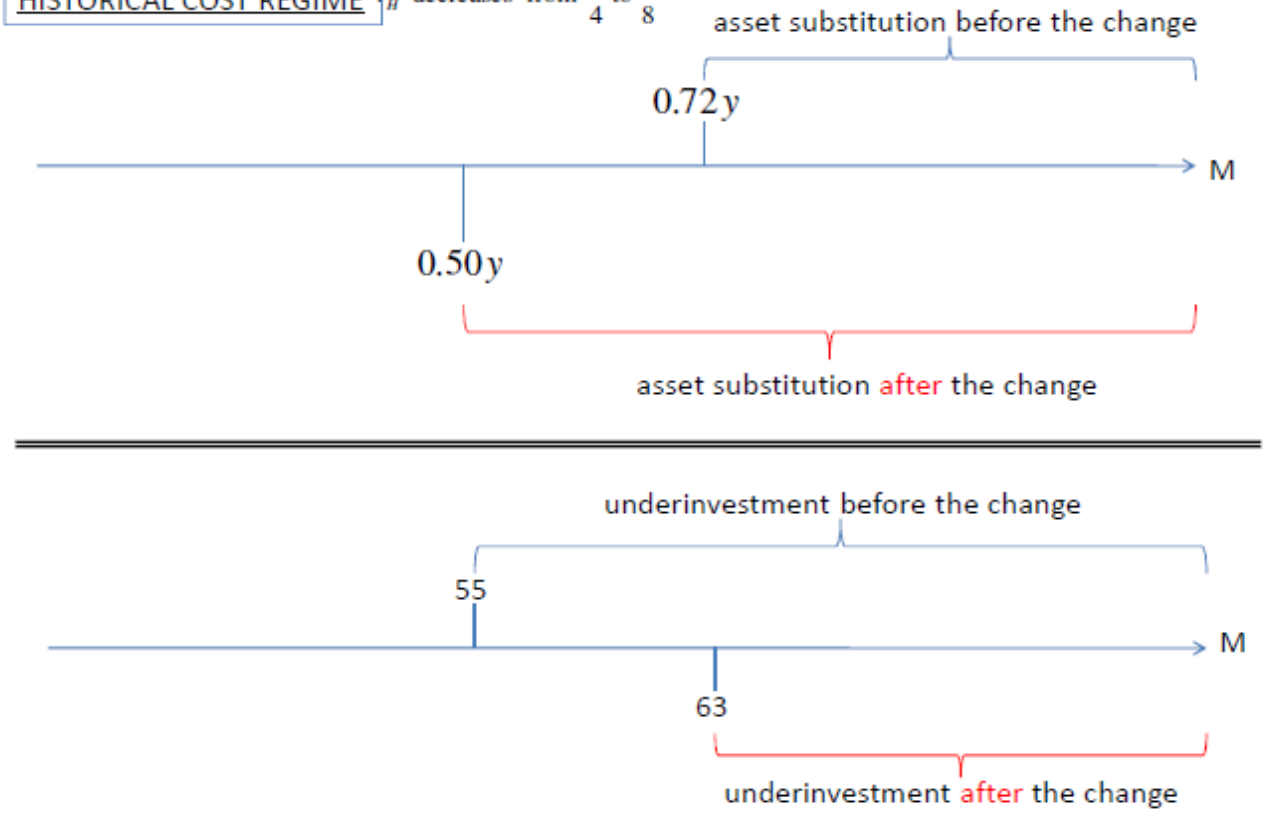
- *Increase* in propensity for asset substitution *alleviates* underinvestment

HISTORICAL COST REGIME r_H decreases from $\frac{1}{4}$ to $\frac{1}{8}$



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- Since high state more likely for high quality project, increase in propensity for asset substitution *increases* incentives to choose high project quality

Optimal Capital Structure and Prudential Constraint in HC Regime

- Bank optimally finances project rationally anticipating project quality choice and asset substitution

Proposition (Optimal Prudential Constraint in HC Regime)

The optimal prudential constraint in the historical cost regime is 1*:* $c^{HC} = 1$*.*

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- Sub-optimal for regulator to constrain capital structure choice

Fair Value Regime

- Balance sheet marked to market every period

$$\frac{D_0}{F_0} \leq c \text{ at } t = 0 \text{ and } \frac{D_1}{F_1} \leq c \text{ at } t = 1, \tag{3}$$

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- If $\frac{D_1}{F_1} > c$—regulator takes control; closely monitors institution to ensure that there is no asset substitution in period 2.

Asset Substitution in FV Regime

- Asset substitution decision and transfer of control determined simultaneously *in equilibrium*

Proposition (Asset Substitution in FV Regime)

Under FV regime, shareholders choose asset substitution if and only if the prudential constraint is greater than a threshold and the maturity value of debt lies in an intermediate interval. That is, asset substitution is chosen if and only if $c_0 < T(c)$ *and* $M \in [c_0 y, T(c)y]$, *where*

$$c_0 \equiv 1 - \frac{\frac{1}{2} - r_H}{\frac{1}{2} + r_H} z_H;\ T(c) \equiv \frac{c}{\sqrt{1+\lambda} - c(\sqrt{1+\lambda} - 1)}.$$

For $M < c_0 y$, *shareholders choose no asset substitution voluntarily. For* $M > T(c)y$, *no asset substitution is chosen because the prudential constraint is violated and transfer of control occurs.*

Transfer of Control and Asset Substitution in FV Regime

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- A tight enough solvency constraint may completely rule out asset substitution
- As asset substitution becomes more attractive, regulator needs to choose tighter constraint to eliminate the possibility of asset substitution

Project Quality in FV Regime

Proposition (Project Quality in FV Regime)

Under the fair value regime, shareholders choose the low project quality q_L if and only if the maturity value M of debt is sufficiently high.

- Unlike *HC* regime, solvency constraint affects project quality

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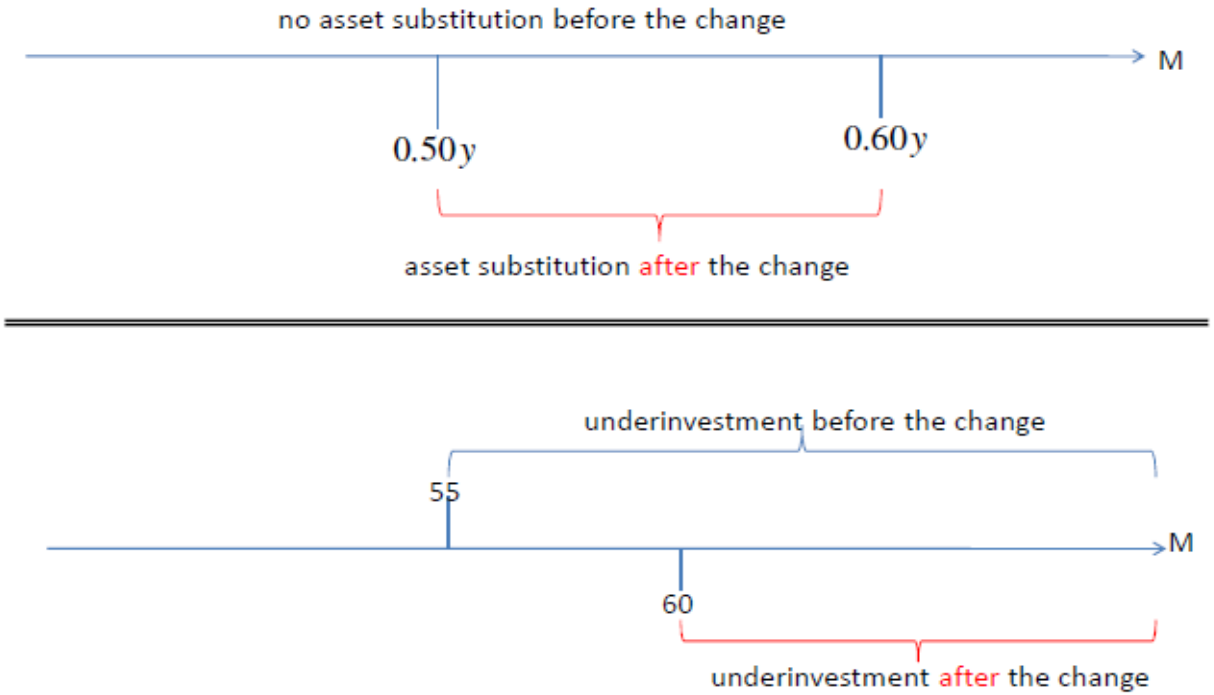
Tradeoff in Fair Value Regime

FAIR VALUE REGIME (c=0.60) r_H decreases from $\frac{1}{4}$ to $\frac{1}{8}$



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- Consequently, shutting down asset substitution via a change in control in the FV regime has a significant negative impact on the project quality choice in the first period.
- As asset substitution becomes more attactive (r_H decreases and/or z_H increases), positive relation between transfer of control and underinvestment becomes more pervasive

Optimal Prudential Constraint in FV Regime

- As in HC regime, interior choice of capital structure optimal

Proposition (Optimal Prudential Constraint in FV Regime)

Under the fair value regime, the optimal solvency constraint, c^{FV}*, is* $\frac{1}{1+\frac{k\sqrt{1+\lambda}}{X_H-k(1+\lambda)}}$.

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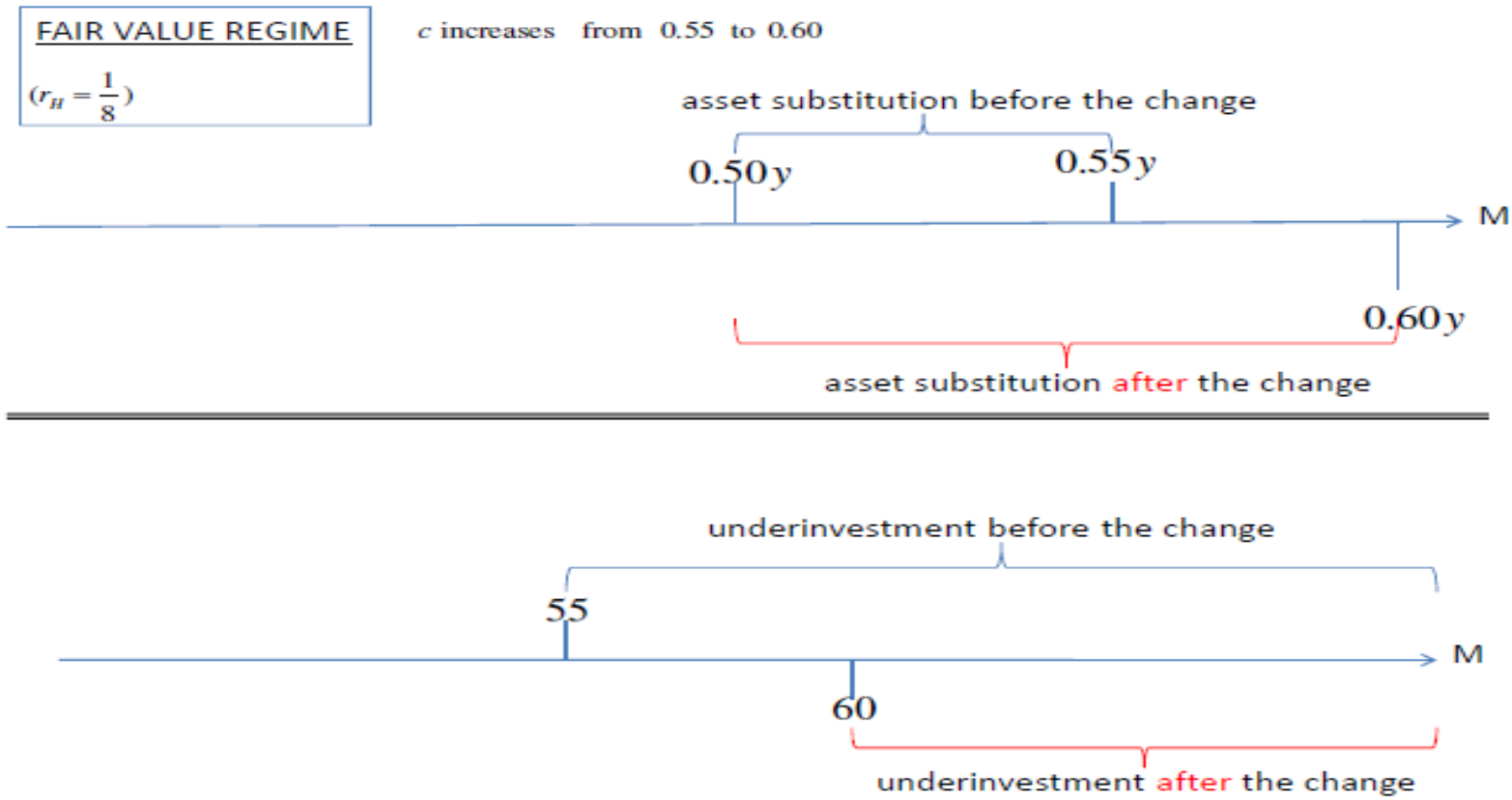
Effect of Prudential Constraint on Tradeoff



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Corollary (Comparison Between Accounting Regimes)

Suppose that $c^{HC} = 1$ *and* $c^{FV} = 1 - \frac{k(1+\lambda)}{X_H}$. *The FV regime always dominates the HC regime.*

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