Investor monitoring

- Comparative corporate governance
  - *The Anglo-Saxon model*: A well-developed stock market, strong investor protection, disclosure requirements, shareholder activism, takeovers. May suffer from short-termism, by both managers and investors.
  - *The German-Japanese model*: Building on banks, long-term relationships, cross-shareholding. May suffer from collusion and favor entrenchment by managers.
  - A text in English: M. Becht, P. Bolton, and A. Röell, A., "Corporate Governance and Control", *Handbook of the Economics of Finance, Vol 1A: Corporate Finance*, 2003, pp. 1-109.
  - A text in Norwegian: T. Nilssen, "Hvordan skaffe kapital til næringslivet? Bank kontra aksjemarked", *Norsk Økonomisk Tidsskrift* 109 (1995), 27-50; available at: http://folk.uio.no/toreni/research/kap_ban_aks.pdf
- A crucial aspect of the debate on corporate governance: the role of *monitoring* in reducing informational asymmetries between firms and investors.
- *Two kinds of outsiders' monitoring*: active and passive
- Correspondingly, *two kinds of information* that outsiders should collect about a firm.
  - *Prospective information*
    - Value-enhancing, strategic.
    - Information that is relevant for the future development of the firm.
    - Information that is needed before decisions are made
      - structural decisions: investments, etc.
      - strategic decisions: advertising, pricing, etc.
      - personnel decisions: replacements, downsizing
    - *Active monitoring* is collecting prospective information and using it to influence decisions.
      - Done by board of directors, venture capitalists, raiders, shareholder activists.

- *Retrospective information*
  - Value-neutral, speculative.
  - Information that is not directly relevant for the future development of the firm and therefore not needed before decisions are made.
  - Measurements of past managerial performance.
    - Basis for managerial compensation.
  - Has no value in itself, in contrast to prospective information.
  - *Passive monitoring* is collecting retrospective information.
    - Done by speculators, rating agencies

- Passive vs active monitoring
  - Exit vs voice
    - Albert Hirschman (1970): *Exit, Voice, and Loyalty*.
  - Comparative corporate governance
    - Short-termism in the Anglo-Saxon model – too much passive monitoring, too little active?
    - Active monitoring can have short-term effects – so even short-term investors may benefit from it, like in takeover raids.
  - Some information is both prospective and retrospective, particularly in situations where management has private information.
- Some key questions:
  - Are the two kinds of monitoring complements or substitutes? If outsiders do more of one kind of monitoring, does that mean the optimum of the other kind now is more or less than before?
  - Should monitoring be delegated? Information is a public good, and so information collection is a natural monopoly. How does this affect corporate governance?

- Entry into corporate governance
  - Active monitoring is done by either
    - enlisted monitors, or *incumbents*, such as boards of directors, or
    - unenlisted monitors, or *entrants*, such as raiders.
  - Why is this distinction important?
    - Monitoring by incumbents may be inefficient, for example because of collusion with management, or because of incentive problems similar to those of management.
    - Replacement of monitors may be necessary
      - Monitoring skills may be unknown
      - Liquidity shocks may occur among monitors
    - Entry into monitoring is costly
      - Coordination problems, for example giving rise to multiple raiders
      - Lack of trust – the flip side of collusion with management by incumbents
      - Rents to entrants – they act on new information and arrive therefore only when there is something to gain, whereas incumbents are there for both upside and downside risks.
      - May affect incumbents' investment incentives
- Incentives to monitors
  - Passive monitors acquire retrospective information only to the extent that they can profit from it.
  - If speculators have collected positive information, they buy shares.
  - If there are many *liquidity traders* in the stock market – traders that buy or sell *not* based on retrospective information – then speculative trading will not have a great impact on the share price, and speculators can earn a lot.

Passive monitoring: Monitoring early performance

- Investment projects may take many years in order for returns to arrive and uncertainty to be realized
- In order to provide the manager with proper incentives, it is necessary to find ways to monitor her early performance
  - because the manager is not able to wait until returns finally arrive with getting compensation.
  - in order to improve on incentive schemes.
- A model of early-performance monitoring.
  - Fixed-investment model: Investment I, own cash A, borrowing from investors $I - A$. Returns R if success, 0 otherwise. Probability of success p_H if entrepreneur's effort is high, p_L if it is low, with $\Delta p = p_H - p_L$. Low effort provides benefit B to the entrepreneur.
  - After the entrepreneur's choice of effort, but before the project returns are known, information can be acquired that is informative about the final outcome.
    - The information is *retrospective* since it aims at revealing whether the entrepreneur put in effort. It is informative about the final outcome because this depends on effort.
  - *Signal*: high or low. A high signal is an indication of a future success.
  - The probability of a high signal depends on effort.
  - σ_{ij} is the probability that the signal is j if effort is i, where i and $j \in \{\text{High, Low}\}$; $\sigma_{iH} + \sigma_{iL} = 1$.
  - ν_j is the probability of project success if signal is j; this probability does not depend on effort.
  - *Ex ante* probabilities p_H and p_L:

    $$p_H = \sigma_{HH}\nu_H + \sigma_{HL}\nu_L$$

    $$p_L = \sigma_{LH}\nu_H + \sigma_{LL}\nu_L$$
  - The high signal enhances the confidence in success:

    $$\nu_H > p_H, \text{ and } \nu_L < p_L$$

- *Benchmark*: the signal is freely available.
  - Now, in principle, the contract can be made dependent on both the signal and the final outcome.
  - But the signal is a *sufficient statistic*: all information about the entrepreneur's effort is in the signal – knowing the final outcome too does not provide more information about effort. Formally, ν_j is independent of effort – when you know the signal, there is not more to learn about effort.
  - So the contract depends on signal only, and not on final outcome: R_b if high signal, 0 otherwise (risk neutrality, limited liability).
  - Incentive constraint for borrower:

$$(\sigma_{HH} - \sigma_{LH})R_b \geq B \Leftrightarrow R_b \geq \frac{1}{\sigma_{HH} - \sigma_{LH}} B$$

  - The entrepreneur receives R_b with probability σ_{HH}, so pledgeable income is

$$p_H R - \frac{\sigma_{HH}}{\sigma_{HH} - \sigma_{LH}} B$$

  - Note:

$$\frac{p_H}{p_H - p_L} = \frac{\sigma_{HH}\nu_H + \sigma_{HL}\nu_L}{(\sigma_{HH} - \sigma_{LH})\nu_H + (\sigma_{HL} - \sigma_{LL})\nu_L}$$

$$= \frac{\sigma_{HH}(\nu_H - \nu_L) + \nu_L}{(\sigma_{HH} - \sigma_{LH})(\nu_H - \nu_L)} > \frac{\sigma_{HH}}{\sigma_{HH} - \sigma_{LH}}$$

  - The existence of a signal increases pledgeable income and makes funding easier.

  - Suppose investors' claims are shares traded on a stock exchange, and let the number of shares equal 1. The interim value of shares is either $\nu_H R$ or $\nu_L R$.

- *Implementation*: Set aside a fraction x of the shares that is given to the borrower in case of a high signal, where
$$x\nu_H R = R_b^*,$$
and R_b^* solves the breakeven constraint:
$$p_H R - \sigma_{HH} R_b^* = I - A.$$
In case of a low signal, investors keep all shares.
  - This is a *stock option*.

- *Costly monitoring*: collecting information incurs a private and nonobservable cost c.
  - The entrepreneur can *hire a monitor* – such as a board member. But the monitor must be provided with incentives to monitor, and to reveal the information collected.
  - If the monitor collects positive information, which happens with probability σ_{HH} if the entrepreneur works, then the value of the firm increases with $\nu_H R - p_H R$.
  - The monitors gets incentives to collect information from example from a stock option on s^* shares with a *strike price* of $p_H R$, where
$$s^* = \frac{c}{\sigma_{HH}(\nu_H - p_H)R}$$

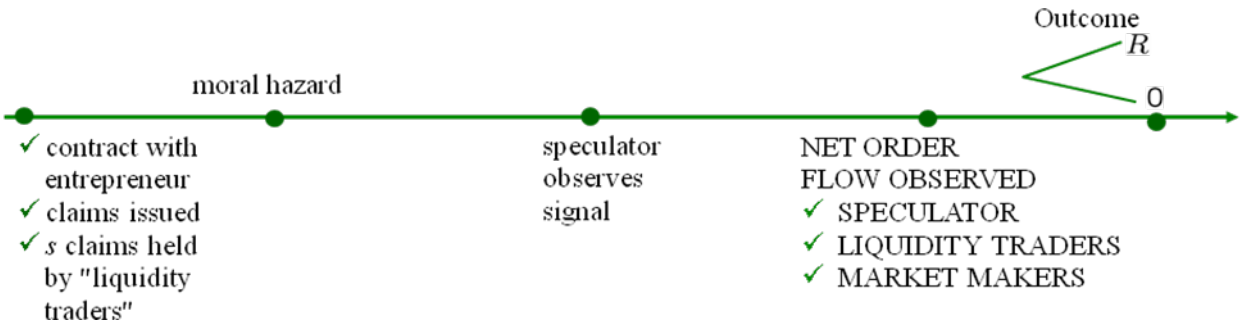
- Collusion between monitor and entrepreneur
  - The two can make an agreement where the monitor does not monitor but still exercise the stock option; the entrepreneur does not work; and the monitor loses less from not monitoring than the entrepreneur gains from shirking if information costs is sufficiently small, and therefore the number of options is small.
  - But what resources does the entrepreneur have to bribe the monitor?
  - Market monitoring is immune to collusive activities.

- Excessive speculation
  - There can be *too much* collection of information.
  - Speculative monitors may be interested in information that is purely about the firm's exogenous shocks. Such information is not informative about managerial effort.
    - Suppose that the monitor, at some extra cost, can obtain not only an informative signal but certainty about the final outcome.
    - If the extra cost is small, the monitor will choose to acquire certain information.
  - This extra information is *not* helpful in terms of early performance measurement.
    - One can no longer base the contract upon an informative signal. Certain information at the intermediate date is equivalent, in terms of incentives, to the case of no monitoring.
  - Excessive speculation reduces pledgeable income relative to the case of no monitoring. Pledgeable income not only must cover incentives for effort but also the cost of monitoring.
  - Relatedly, the monitor may have incentives to acquire the *wrong* information: When multiple measures of performance are available, monitors may be mostly interested in those that mainly inform about exogenous information, so that the monitoring is of little help for incentives and pledgeable income.

Market monitoring

- Sometimes, enlisted monitors are not available.
- The alternative is market monitoring – done by a monitor whose identity is unknown, at least *ex ante*.
- Again, the question is how to provide both the monitor with incentives to monitor, and the entrepreneur incentives to put in effort.
- The entrepreneur issues shares that are publicly tradeable.
- There is a single, anonymous monitor, called *the speculator*.
- The effect of his presence depends on initial investors' *liquidity trading*.
    - A liquidity trade is a sale of shares in order to get cash. Liquidity traders are shareholders with need for cash.
- Suppose first that initial investors have no liquidity needs before the project is finalized – there is no liquidity trading in the share.
- If the speculator acquires the retrospective information and it is positive, then he knows the firm is undervalued by $(v_H - p_H)R$ per share and wants to buy shares from the initial investors.
- But initial investors do not want to sell at price $p_H R$. Anyone wanting to buy at a higher price must be a speculator with positive retrospective information, so they will only sell at price $v_H R$.
- Hence, the speculator cannot profit from his information and will have no incentives to collect it.
    - A *no-trade theorem*.
    - Note the difference from the enlisted monitor, who can be offered a stock option with a strike price different from the market price. The unenlisted monitor – the speculator – has an endogenous strike price – the market price.
- In order for speculation to be profitable, the market price must not respond too much to he speculator's purchase order. – The stock market for this share must be *deep*.

- *Market depth* obtains when
  - there are liquidity traders among the initial investors
  - their total supply of shares is not known.
- A case of a deep market:
  - A fraction *s* of initial investors are *liquidity traders*: with probability λ, they will all need to sell their shares before the final outcome is realized; with probability $(1 - \lambda)$, none of them faces a liquidity need.
  - The other investors – the *long-term investors* – have no information whether or not there is liquidity trading.
- Two comments
  - perfect correlation among liquidy traders
  - the rationality of liquidity traders
- Suppose long-term investors cannot tell the speculator's order apart from liquidity traders' order.



- Speculator's demand for shares: *y*
- Liquidity traders' demand for shares: *z*
  - $z = -s$ in case of a liquidity shock; $z = 0$ otherwise.
- The speculator wants to hide his presence. So if he decides to buy, he will want to buy *s* shares
  - $y = s$ in case of positive retrospective information, $y = 0$ otherwise.

- Summarizing the four possible states of the world:

		Prob. σ_{HH}	Prob. $1 - \sigma_{HH}$
		High signal	Low signal
Prob. λ	Liquidity sales	Stock price: P Net order: 0	Stock price: $\nu_L R$ Net order: $-s$
Prob. $1 - \lambda$	No liquidity sales	Stock price: $\nu_H R$ Net order: s	Stock price: P Net order: 0

- Net order flow = supply – demand
- Two instances of zero net order:
  - Liquidity traders have a shock, and the speculator has positive information
  - Liquidity traders have no shock, and the speculator has negative information.
- The market price following a zero net order is

$$P = \left[\frac{\lambda\sigma_{HH}}{\lambda\sigma_{HH} + (1-\lambda)\sigma_{HL}}\right]\nu_H R + \left[\frac{(1-\lambda)\sigma_{HL}}{\lambda\sigma_{HH} + (1-\lambda)\sigma_{HL}}\right]\nu_L R$$

- The speculator's expected profit:
  - With probability $\lambda\sigma_{HH}$, he learns positive information *and* a liquidity shock occurs so that he can disguise his demand,
  - … in which case his earning per share is

$$\nu_H R - P = \left[\frac{(1-\lambda)\sigma_{HL}}{\lambda\sigma_{HH} + (1-\lambda)\sigma_{HL}}\right](\nu_H - \nu_L)R$$

  - So expected profit is

$$\lambda\sigma_{HH}\left[\frac{(1-\lambda)\sigma_{HL}}{\lambda\sigma_{HH} + (1-\lambda)\sigma_{HL}}\right](\nu_H - \nu_L)Rs$$

- If information collection costs c, the speculator needs at least s^{**} shares – that is, at least a fraction s^{**} of liquidity traders among initial investors, where s^{**} solves:

$$\lambda\sigma_{HH}\left[\frac{(1-\lambda)\sigma_{HL}}{\lambda\sigma_{HH}+(1-\lambda)\sigma_{HL}}\right](\nu_H-\nu_L)Rs^{**}=c \Leftrightarrow$$

$$s^{**}=\frac{c}{\lambda\sigma_{HH}R(\nu_H-\nu_L)\dfrac{(1-\lambda)\sigma_{HL}}{\lambda\sigma_{HH}+(1-\lambda)\sigma_{HL}}}$$

  - Comparison reveals that $s^{**} > s^{*}$ – the speculator needs a larger "option" than the enlisted monitor to break even.
- Comparison enlisted monitor/speculator
  - The speculator needs a higher option in order to perform
  - Pledgeable income is the same (as long as entrepreneur is risk neutral)
  - Market monitoring less subject to collusion
  - Enlisted monitor may not be available after all or may not have the ability to monitor.
- Relation to empirical findings
  - Firms with liquid shares have manager compensation tied to share prices, while firms with illiquid shares use bonuses
  - The *equity premium*: holding shares has consistently a higher return than holding debt
    - Liquidity traders lose in expectation in the presence of a speculator. In order to attract liquidity traders, shares must be sold at a low price. Thus, long-term traders obtain an extra profit.

Passive monitoring with debt

- *Demandable debt*: an option for a holder of a debt claim to convert a long-term debt into a short-term debt that has to be paid before the project is finalized.
  - May provide incentives for the debt holder to collect retrospective information
  - Suppose a debtholder has a claim equal to *D*. He can be enlisted as a monitor, with information cost *c*, if an option to turn the claim into short-term debt *d* when monitoring reveals negative information, is preferable to not monitoring and either always demanding the debt or always rolling it over:

$$c \leq \sigma_{HH}(\nu_H D - d)$$

    - always demanding the debt has a cost when retrospective information is positive

$$c \leq \sigma_{HL}(d - \nu_L D)$$

    - always rolling over has a cost when retrospective information is negative
  - In combination, the two constraints say that a debtholding monitor can be provided with incentives if there exists a *d* such that

$$\nu_L D + \frac{c}{\sigma_{HL}} \leq d \leq \nu_H D - \frac{c}{\sigma_{HH}},$$

    which is the case if *c* is relatively small.

- *Debtholders vs equityholders as monitors*
  - Monitoring by debtholders affects liquidity, whereas monitoring by equityholders does not.
    - Monitoring by equityholders is *liquidity neutral*.
    - Monitoring by debtholders is *liquidity managing*.
  - Calling in liquidity in case of negative retrospective information, collected by a debtholding monitor, may be good for the funding of the firm.