

Corpfin module 11, "Agency Problems, Monitoring, Compensation Systems" practice problems

Brealey and Myers Chapter 12 "Agency problems, compensation, performance measurement"

(The attached PDF file has better formatting.)

** Exercise 11.1: Agency problems

Brealey and Myers discuss agency problems and possible solutions (monitoring and incentives). This exercise reviews the items that you should know for final exam problems.

- A. What types of firms have agency problems?
- B. Explain the following types of agency problems: slacking off, avoiding risk, empire building, job security.
- C. How does the debt-to-equity ratio affect agency problems?
- D. How are managers monitored? Why is monitoring not too effective to resolve agency problems?
- E. How do compensation incentives resolve agency problems? Why are incentives not too effective?

Part A: Firms whose managers are different from their owners have potential agency problems. Corporations and large private firms are examples. Firms whose owners manage operations do not have agency problems.

Part B: Four types of agency problems mentioned in this exercise are

1. Managers may slack off if they are not monitored. Most managers are paid by salary to work a certain number of hours a week. They should be monitored and paid at least in part by performance.
2. Managers may avoid risky projects with high rewards that shareholders would like to assume. Managers are more concerned with retaining jobs in a solvent firm than with potential gains that accrue to owners.
3. Managers may build empires by acquisitions instead of seeking positive NPV investments. A firm's senior executives may prefer to build a large enterprise by acquiring other firms, even if they pay high premiums over market prices, which gives them an immediate empire to run, instead of looking for investments with positive net present values that take long to show results.
4. Managers may accept projects with negative NPV's that entrench their position in the firm. For example, when oil companies had high profits after the OPEC oil price rises in 1973 and 1979, they spent much of these profits exploring for oil in the United States. These were negative NPV projects, but unfinished oil exploration made the managers more necessary to the firm.

Part C: If the debt-to-equity ratio is high, managers must be sure they earn profits to service the debt. They are less likely to slack off, build empires, or start negative NPV projects. Leveraged buyouts force managers to keep their eyes on the debt payments, so they induce hard work. If the debt-to-equity ratio is low, managers are using owners' money, and they may place their own interests first. They may slack off, build empires, or start negative NPV projects that give them job security. [Note: Leveraged buyouts are discussed in a later module on capital structure, not in this chapter.]

Part D: The Board of Directors appoints and fires senior managers, and it is responsible for monitoring their performance. The audit committee of the Board of Directors reviews the accounts to ensure that owners' interests come first. But the monitoring may not be effective if the CEO of the firm is also the chairman of the Board of Directors. Some financial economists say that the board should have a majority of outside directors (unaffiliated with the firm), so they can objectively monitor managers' actions.

Part E: CEO's paid by executive stock options are more likely to take risks to increase the value of the firm. But stock options work for the CEO, whose decisions directly affect the firm's performance and stock price. They have less effect on middle managers, whose decisions have negligible effect on the stock price.

Stock options work best if the firm's stock price depends on its managers' decisions. But stock prices depend also on industry performance and general stock market movements.

Stock options reflect the performance of the firm relative to expectations. If the CEO is a good manager, the market price of the stock already reflects the expected performance of the firm. The stock option has positive payoff if the firm does even better than expected. Stock options are an incentive to do better than expected, but good managers should also be paid by other performance based compensation.

See Brealey and Myers, page 307

**** Exercise 11.2: Stock options and agency problems**

A stock insurer writes Homeowners coverage in Gulf Coast states.

- Inland properties are not exposed to hurricanes and have average expected returns on capital of 5%.
- Coastal properties are exposed to hurricanes and have average expected returns on capital of 25%.
- The overall average expected return on capital is 15%.
- Underwriting (profit) cycles vary the overall expected return on capital from 0% to 30%.
- The insurer can buy catastrophe covers whose net cost is 20% of capital.

The insurer is an excellent Homeowners underwriter of high risk properties. It can specialize more in high risk properties and raise its expected return to 20% or its can diversify into personal auto coverage and reduce its expected return to 10%.

- A. Explain the agency problems faced by this insurer's owners.
- B. How might monitoring solve agency problems?
- C. How might compensation systems solve agency problems?
- D. Why do underwriting cycles reduce the effectiveness of performance based compensation?

Solution 11.2: This exercise applies the concepts in the textbook to a Homeowners insurer. The scenario is not wholly realistic, but it illustrates the principles in this module.

Part A: The owners want the insurer to write high risk coastal properties with a 25% expected return on capital. Owners hold diversified portfolios of many stocks, so if one firm goes broke, the effect on the overall portfolio is negligible. The managers of the insurer prefer to write inland properties with 5% expected returns on capital. If the insurer writes coastal properties which are all damaged in a severe hurricane, the insurer may become insolvent and they would lose their jobs.

The insurer's managers can circumvent owners' interests other ways as well. If they write high risk coastal properties with a 25% return on capital, they can buy catastrophe covers to avoid insolvency. The net return on capital is still 5%. Owners with diversified portfolios prefer no reinsurance (or minimal reinsurance).

Owners want the insurer to specialize in high risk Homeowners coverage. Managers prefer to diversify into personal auto coverage, to reduce the risk of insolvency.

[*Note:* In practice, insurers writing only high risk coastal properties with a high probability of insolvency from hurricanes would have poor ratings and may be avoided by agents. This exercise is theoretical.]

Part B: If the insurer were owned by a few knowledgeable investors, they might have the Board of Directors set a policy of writing high risk coastal properties with little reinsurance. They would expect the insurer to become insolvent once every 20 or 30 years, but they would earn 25% returns each year until then. The Board of Directors might specify the type of risks to be written, and it would review the performance of managers.

In practice, this is not possible. Owners are thousands of investors with little knowledge of insurance. The Board of Directors is controlled by the managers, and it sets policy as managers want: write a mix of coastal and inland properties, buy reinsurance to transfer catastrophe risks, diversify into personal auto insurance.

Part C: The CEO's compensation may be stock options with an exercise price increasing at 5% per annum. If the insurer writes safe inland properties, the stock options pay nothing, since the stock price also increases 5% per annum. If the insurer writes high risk coastal properties, the stock options have high expected payoffs.

Part D: Owners want the CEO's pay to reflect performance. But underwriting cycles distort the results. In soft markets, the options may pay nothing even if the insurer writes high risk coastal properties, and in hard markets, the options may be valuable even if the insurer writes low return inland properties.

[*Note:* Final exam problems do not test the specifics of insurance underwriting.]