

Decentralized Ralph

An owner, Alice, runs a decentralized firm where division managers have significant authority to make production and investment decisions. Alice is reasonably pleased with the way the decentralized organizational structure is working. The divisional personnel are well-motivated when given authority over their own operations. In addition, they are much better informed about local procedures and problems. (This is conventionally considered to be the usual benefit of decentralization.)

The company from time-to-time makes long-term investments. All capital expenditures must be approved by central (Alice). Divisions must submit detailed cost budgets to central prior to approval. This is one area where Alice is somewhat disappointed with decentralization, as divisions show a marked tendency to "pad" their budgets. Slack in the budgets makes life more pleasant at the divisions. If a divisional budget is successfully padded, divisional personnel need not work as hard or as efficiently. Also, they may be able to consume corporate perquisites. Alice, on the other hand, would like to minimize the amount slack in budgets (other things being equal).

Alice (at central) supplies all the funds for capital expenditures, so she has the option of reducing the budget (cutting projects) before she approves it. However, this is a delicate exercise, since Alice usually does not know the actual costs associated with investment and operating expenses. Division, being better informed, does know the actual costs prior to submitting a budget.

Alice is aware that Ralph, a divisional manager, has a capital project which will yield a cash flow to \$120,000 at the end of one year. Alice is not sure what the cost of the project will be. Alice believes there are two possible levels of cost: \$90,000 with probability .5, or \$60,000 with probability .5. This is a situation where we have the information asymmetry that motivates the decentralized organizational form.

Alice's opportunity cost of capital is 20%, and she is risk neutral, i.e., she seeks to maximize the expected net present value of future cash flows. For simplicity, assume that the budget is submitted and funds are provided to division at the beginning of the year. The cash inflows from the project will be available one year after the investment is made, so they are discounted.

Questions:

1. Suppose Alice provides the amount of cash requested by Ralph. Further assume that the division wants to pad its budget when possible and that Alice cannot detect a padded budget. This type of contract is termed a "slack" contract. Under this contract, what is the expected net present value of the project to Alice (residual)? (Note: in this setting a *contract* means specification of (1) the amount to be provided to Ralph at the time he submits his budget, and (2) the amount expected to be returned to Alice in one year, both of which may be based on the budget submitted to Alice at the start of the year.)
2. Assume that Alice decides she will only approve the project if Ralph indicates that the cost of the project is low. Assume that the only funds available for Ralph to invest are those received from Alice. Under this contract, what is the expected net present value of the project to Alice (residual)?
3. How much is Alice willing to pay (in today's dollars) for project auditing which perfectly reveals the cost of the project?
4. Alice is not sure that the probabilities assessed as above are accurate. What is the probability on the high cost that would make Alice indifferent between a rationing contract (in item 2, above) and a slack contract. Remember, since there are only two possible cost levels, the probabilities on high and low cost must add to one.