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Chapter 18.2

Delegation of decision-making

Outline

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- It is typical for investment banks to give even junior employees significant responsibilities in making decisions; it is common that such decisions are made by individuals or the immediate team that advises clients, but routinely any such decisions do not have to be approved by senior managers.
- Such decision-making is often referred to as being 'delegated' because senior managers delegate the power to make such decisions to employees they are supervising.

Outline

- We will compare the profits generated to investment banks from centralised and decentralised decisions, to see under which conditions, decentral decisions are optimal.

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Ideas and their implementation

- Investment banks give staff significant responsibilities in providing advice to clients
- It is usually the team working with a client that develops advice and then seeks to implement it for their client
- In many other organisations, ideas are developed by managers and then implemented by employees

Ideas and their implementation

→ Advice to clients is usually developed by those that interact with the client and it is the same team which will then seek to implement the advice.

- Part of the culture of investment banks is that employees are given significant responsibilities when providing advice to clients. Before advice is presented to clients it is normally not necessary to seek the approval of a more senior manager. In many other organisations such decisions need to be approved by managers before customers are contacted.
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  - Advice is usually developed in a small team that works with the client to develop the advice they seek,
  - and once they have developed this advice, it is presented to their client and, with their agreement, steps are commencing to implement the advice. At no point is the advice approved by a more senior manager.
- In investment banks it is common for those staff members that are client-facing to develop advice and implement it; in many other organisations it is managers who develop ideas, which are then implemented by more junior staff.

→ Investment banks see coincidence of generating ideas and implementing them, which we can interpreted as a decentral decision-making, while in other organisations these two elements are often separated,

Signals about clients

- Assume the investment bank decides whether to accept a new client, the probability that it will generate surplus is $p = \frac{1}{2}$
- Managers and employees obtain a signal with precision $\rho_i > \frac{1}{2}$
- Bayesian learning gives the probability of the client generating a surplus after receiving the signal as $\hat{p}_i = \frac{p\rho_i}{p\rho_i + (1-p)(1-\rho_i)} = \rho_i$

Signals about clients

→ We can now set out the basic elements of the model that will help us to determine whether decentral decision-making is optimal for investment banks.

- To illustrate the problem on hand, assume that a decision needs to be taken whether a new clients is accepted or not.
  - We assume that a client generates is as likely to generate profits for the investment bank than it does not.
- Managers and employees obtain a signal about the client generating profits for them, which is correct with probability ρ_i. This probability is also called the precision of information, as if it is 1, the signal will always be correct. The precision of information can vary between managers and employees.
- Having obtained the signal, the manager and the employee will update their beliefs about the likelihood with which the client will produce profits. We use Bayesian learning to update their beliefs and the updated beliefs are given as in the *formula*; inserting that $p = \frac{1}{2}$ will then give the final result.

→ Having updated their beliefs, we can now see how employees are rewarded for their decision to accept a new client.

Remuneration of employees

- Employees are working with the client and have to exert effort to generate surplus, which costs them C
- Managers do not exert effort as they are not involved in working with the client
- Employees are paid a wage w_S if surplus is generated and $w_F \leq 0$ if no surplus is generated
- If no surplus is generated, the negative wage can be interpreted as losing a bonus
- Managers are rewarded through the profits they generate

Remuneration of employees

→ We now will see how employees are wpaid when working with clients.

- It will be employees that work with the client to provide advice, not the manager.
- In order to generate profits from the new client, employees need to exert effort and this will impose costs on them.
- Managers will not require to exert this effort, and hence will not face any costs,
- as the work is conducted by employees only.
- If the client generates a surplus employees are paid a salary w_S,
- but if no surplus is generated, they receive a different (lower) wage.
- Managers are paid from the profits the investment bank generated and they do not have a fixed wage.
- A negative wage can be intereoreted as losing bonus payments rewarded for other activities or the clawback of bonus from previous years.

→ Using this setting, we can now determine the optimal way decisions are made about the client being accepted by the investment bank. In delegated decision-making this decision is made by the employees and in centralised decision-making it is made by the manager.

- We will first consider the case of delegated decision-making, that is the decision whether to accept the client is made by the employees who will have to work with the client.

Employees exerting effort

- Expected wage: $w = \rho_E w_S + (1 - \rho_E) w_F$
- If no effort is exerted, no surplus is generated and the employees receives w_F
- To exert effort, we need $w - C \geq w_F$, or $w_S \geq w_F + \frac{C}{\rho_E}$
- To be an employee, we need $w - C \geq 0$, or $w_S \geq -\frac{1-\rho_E}{\rho_E} w_F + \frac{C}{\rho_E}$
- As $w_F \leq 0$, the latter is more restrictive and $w_S = -\frac{1-\rho_E}{\rho_E} w_F + \frac{C}{\rho_E}$
- We then get $w = C$ and the employee breaks even

Employees exerting effort

→ We will first determine the conditions under which employees exert effort when advising the client.

- Employees will obtain the wage w_S is the client generates profits to the investment bank, which employees infer from the precision of the signal they have received. If the cient does not generate any profits, the employee with receive wage w_F.
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  - We assume that without any effort, no profits can be generated
  - and the employees obtain the wage w_F with certainty.
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  - If the employee exerts effort, it will obtain the expected wage from above, but will also face his cost of effort. In order to exert effort, the net benefits face to the employee need to exceed the wage received without exerting effort.
  - Inserting for the expected wages, we can get the minimum wage in case the client generates profits that needs to be paid such that the employee exerts effort.
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  - An employee would accept employment only the wages, net of the effort costs, are positive.
  - Inserting for the expected wages, we can get the minimum wage in case the client generates profits that needs to be paid such that the employee exerts effort.
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  - As the wage if the client is not producing profits is negative, the right-hand side is larger in the second constraint, which will thus be the minimum wage the investment bank has to pay if the employee is to exert effort.
  - The investment bank will not pay wages higher than the minimum as it maximizes its profits and will hence set the wage such that it equals the constraint.
- Inserting for the wages we see that the expected wage cob=vers the effort costs of employees.

→ We can now use this wage to determine the profits of the investment bank.

Investment bank profits

- Investment bank profits are the revenue, if the client generates such, less the wages paid to employees
- $\Pi_D = \rho_E V - w = \rho_E V - C$
- Managers are paid out of these profits

Investment bank profits

→ The investment bank profits are now the revenue they obtain from the client, less the wages they pay to the employees.

- The client will generate revenue to the investment bank of V,
  - but only if the client is generating any profits at all.
  - From this revenue, the investment bank pays the wages of its employees.
- *Formula*
  - We can insert for the wages from above and can simplify the investment bank profits.
- We assume that managers obtain a fraction or all of the profits the investment bank generates, such that we can use these profits as the profits of the manager.

→ We have thus established the profits of investment banks in the case decisions on accepting the new client are made decentral by the employees.

- We will now consider the case where the decision to accept a new client is made by managers.

Learning from two signals

- If the manager decides to accept the client, the employee has two signals: his own and that of the manager
- The signal of the manager is positive as else he would not have accepted the client
- The employee would update his beliefs in the probability the client produces surplus
- If the employee also receives a positive signal, we get $\pi_H = \frac{\rho_E \rho_M}{\rho_E \rho_M + (1-\rho_E)(1-\rho_M)}$
- If the employee receives a negative signal, we get $\pi_L = \frac{\rho_M (1-\rho_E)}{\rho_M (1-\rho_E) + (1-\rho_M)\rho_E}$
- We find that $\pi_H \geq \pi_L$

Learning from two signals

→ With the manager having made a decision whether to accept a client or not, the employee now has two pieces of information, his own signal and the decision of the manager.

- With the manager making the decision whether to accept a new client, the employee has two sources of information,
  - its own signal and the decision of the manager. The employee can therefore determine the likelihood with which the client is profitable using both sources of information.
- We can state that the signal the manager has received must be positive.
  - With a negative signal, he would not have accepted the new client.
- Based on the manager having accepted the client and thus obtained a positive signal, the employee updates his beliefs about the likelihood of the client generating profits. We will again use Bayesian updating to adjust the likelihood.
- We can distinguish the case where in addition to the positive signal of the manager, the signal of the employee is also positive. In this case the likelihood of the client being profitable is given by this *formula*.
- The second case is where in addition to the positive signal of the manager, the signal of the employee is also negative. In this case the likelihood of the client being profitable is given by this *formula*.
- We can easily show that if the signal of the employee is positive the probability of the client being profitable is higher than when the signal received is negative

→ We do not need to consider the case of the manager receiving a negative signal and thus not accepting the client as in that case the employee with not receive any wages, because no new client is recruited.

Wages of employees

- Expected wage: $\hat{w} = \pi_i \hat{w}_S + (1 - \pi_i)\, w_F$
- Exert effort if $\hat{w} - C \geq w_F$
- This gives $\hat{w}_S \geq w_F + \frac{C}{\pi_i}$
- To ensure the employee exerts efforts regardless of his signal, we set wages such that this is fulfilled for $\pi_i = \pi_L$
- This gives us $\hat{\hat{w}} = \rho_M \hat{w}_s + (1 - \rho_M)\, w_F = w_F + \frac{\rho_M}{\pi_L} C$

Wages of employees

→ We can now determine the wages the employee will receive.

- The wage in case the client is profitable may be different to the wage in delegated decision-making, but for simplicity we assume that the wage in the case the client is not profitable remains the same. The expectations will now be formed based on the two signals the employee has received.
- Again, effort is exerted if the wage net of effort costs, exceeds the wage when not exerting effort, the wage where the client does not produce any profits to the investment bank.
- Inserting for the expected wage, we can again solve for the minimum wage required in the case the client is profitable.
- The minimum wage will depend on whether the signal the employee has received is positive or negative. We propose that the investment bank sets the wages such that employees exert effort regardless of the signal they obtain. Hence this constraint must be fulfilled for the negative signal. It is easily to see that the wage paid will exceed the effort costs of employees.
- Inserting this minimum wage the investment bank will pay if the client generates profits, gives us the wage the manager expects to pay. He will base this expectations only on his own signal which gives him a probability ρ_M that his positive signal was correct. We implicitly assume that the manager does not know the signal his employees have received.

→ We can now use these expected profits to determine the profits of the investment bank in this case of centralised decision making.

Investment bank profits

- We have $\Pi_C = \rho_M V - \hat{\hat{w}} = \rho_M \left(V - \frac{C}{\pi_L} \right) - w_F$
- To choose delegated decision-making we need $\Pi_D \geq \Pi_C$
- This requires $\rho_M \leq \rho_M^* = \frac{\rho_E(1-\rho_E)V-(1-2\rho_E)C+(1-\rho_E)w_F}{(1-\rho_E)V-(1-2\rho_E)C}$
- If the manager's signal is not too precise, then delegated decision-making is optimal
- This is always fulfilled if employees have more precise signals $\rho_E > \rho_M$

Investment bank profits

→ Using the wages of employees it is now straightforward to determine the profits the investment bank makes from this arrangement.

- The profits, as expected by the managers are consisting if the revenue the client provides, if based on the manager's signal it provides any revenue, less the wages it expects to pay.
  - Inserting for the expected wages allows us to rewrite the profits as in the *formula*/.
- Delegated decision-making will be chosen if this is more profitable for the manager, thus if the profits of the investment bank are higher.
- We can solve this condition and obtain this *formula*.
- We see that delegated decision making is optimal if the precision of the information the manager has is not too high.
- We can show that whenever the signal received by employees is more precise than that by managers, delegated decision-making is optimal; in other cases this would depend on the exact parameter constellation.

→ We will now look in more detail at the case where the manager has a more precise signal than the employee.

Delegation even if managers have more precise signals

- We have $\rho_M^* > \rho_E$ if $w_F > (1 - 2\rho_E)\, C$
- Delegated decision-making is preferred if $\rho_E < \rho_M \leq \rho_M^*$
- Even if manager's signals are more precise, delegation might be preferred
- This is because employees having negative signals, see low prospects of the client producing surplus

$\Rightarrow$ This requires larger incentives to exert effort

$\Rightarrow$ Higher wages are paid, reducing profits of investment banks

Delegation even if managers have more precise signals

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- We can show that the maximum information precision of the manager can be higher than the information precision of the employee if the wage of in case of the client not generating profits is not too low. Remember that the wage in this case was negative and we had assumed that $\rho_i > \frac{1}{2}$, making the right-hand side also negative.
- We thus have a case that if the signal precision of managers is better than that of employees, but not too much better, delegated decision-making is optimal
- We have a case here that even if the manager has more precise information, it would be optimal to delegate decision-making.
- If the employee has a negative signal, despite the manager having received a positive signal, it will nevertheless assign a low probability of the client generating profits.
- [⇒] If the employee believes the probability of receiving the higher wage from the client being profitable is low, he will be reluctant to put exert effort.
- [⇒]
  - In order to ensure the employee exerts effort, the manager needs to increase the wage for this scenario.
  - The increased wage will reduce the profits of the investment bank, and hence the manager, making centralised decision-making less attractive.

→ We thus see that as long as managers do not have much better information than employees, delegated decision-making is optimal. The central assumption here is that effort is exerted not by the manager, the decision-maker in the centralised decision-making, but by employees who will have their own view on the desirability of this client. It is the moral hazard of employees not exerting effort that make delegated decision-making so attractive.

- We can now summarize the key finding and discuss some more general aspects in investment banks.

Optimal delegation of decisions

- Delegation of decisions is optimal if employees are better informed
- Even if they are not better informed, delegation might be optimal
- If employees receive negative signals on the prospects of the client, they are more difficult to incentivise to exert effort
- If these required additional incentives are large enough, then profits of investment banks are higher with delegation

Optimal delegation of decisions

→ Delegated decision-making can be optimal even if managers have better information than the decision-makers themselves.

- We have seen that delegated decision-making is always better if employees have better information; this result is not surprising as the person with the better information usually makes the better decision.
- However, even if they are not better informed than managers, employees should make the decision, assuming the informational advantage of managers is not too large.
- Employees receiving a negative signal will generally be sceptical about the prospects of the decision of the manager, making it more difficult to motivate them. The manager needs to use additional incentives to ensure the employees exert the necessary effort.
- Additional incentives are costly to investment banks, they might be higher wages, but also more intense monitoring and other measures. This reduces their profits and makes delegated decision-making attractive to investment banks.

→ The nature of investment banks is that employees cannot be well monitored and their efforts to extract profits from clients will be difficult to assess. For thsat reason investment banks need to work with incentives, which, as we have seen, favours delegated decision-making.

Delegated decisions in investment banks

- Investment banks rely on the knowledge of their staff and need to motivate them to use this knowledge
- Imposing decisions that employees disagree with, is costly and can reduce profits
- Often it is preferable to delegate decisions to maintain incentives to exert effort even if managers are better informed
- Investment banks typically delegate decisions more than many other organisations

Delegated decisions in investment banks

→ Let us finally look at some specific concerns in investment banks.

- Investment banks do not have production facilities, but their 'capital' is the knowledge of their employees.
  - It is not easy to 'command' them to use their knowledge as it is difficult to determine what the knowledge they have is in the first place. Thus investment banks work primarily through incentives to motivate employees to use their knowledge.
- In this context imposing decisions on employees they disagree with will cause resentment and can result in less effort being exerted, which can be costly to the investment bank in terms of revenue lost, but also reputational loss.
- This results in a situation where in order to ensure that employees are motivated, decisions are left to them.
  - In order to reduce moral hazard, this might be optimal even if others are ina better position to make the decision. Providing incentives to overcome a disputed decision can be very expensive.
- The nature of the investment banking business is such that delegation of decisions is much more widespread than in most other industries.

→ Other industries in which decisions are commonly delegated include management consulting and lawyers. Both professions rely heavily on the use of information and knowledge, similar to investment banking.

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