Andreas Krause

Chapter 16.2

Promotion practices

Outline

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Outline

- In investment banks, employees typically take on more responsibilities at an early stage in their career than in most other industries; only employees in management consultancies commonly take on comparable responsibilities,
- We will seek to explain why this practice is widespread in investment banks, but less common in other industries, including other areas in finance.

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Outline

- We will look at different strategies investment banks could pursue when allocating tasks to employees.
- We will look at the responsibilities an employe is given after he has fulfilled their role well and after they have failed in their role, for example advised clients wrongly causing the client or the investment bank to incur a loss.
- Based on this allocation of responsibilities, we will then look at the allocation of responsibilities in the first place.

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- We will start by giving a better characterisation of the responsibilities and different roles in an investment bank.

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Hire and fire mentality

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Hire and fire mentality

→ Investment banks have a high turnover of staff and those employees not performing satisfactorily based on the expectations of the investment banks are often dismissed or otherwise induced to leave the employment of the investment bank.

- It is typical for investment banks to give employees high levels of responsibilities at an early stage in their careers. Even in junior positions, employees are fully involved in advising clients and can bring in their ideas and assessments. This is in contrast to many other industries where junior employees are involved only in a supporting role until they have gained sufficient experience.
- Employees not performing well are quickly barred from any promotions and can often even be dismissed to pressured to resign.
- Those you are successful and contribute to the advice clients receive, can be promoted quickly to more senior positions.

→ We will look at this approach to manage staff responsibilities in their early career and how investment banks would react to a low performance of an employee.

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Hire and fire mentality

- Investment banks give high responsibilities to employees in early career stages

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- Not performing well in the early srage of a career is easily a bar to promotion

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Task types

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Task types

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- We will consider two types of tasks, one is deemed to be low-risk in that if the employee does not perform well, the investment bank does not suffer losses.
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  - Such tasks are usually not directly client-facing, such as roles in the back office of the investment bank, essentially administrative tasks which are subject to multiple checks and balances, reducing the impact of any errors.
  - Such low-risk tasks might also include activities that are deemed safe and require low skilled, such as market making, where prices in markets are set in response to trading demand; these tasks are to a large degree automated
  - It might also include working in brokerage, the routing of orders to an exchange, which requires lower skills.
- If an employees fails to perform adequately in a high-risk task, it may cause the investment bank a loss.
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  - High-risk tasks includes giving advice to companies in mergers and acquisitions or when underwriting securities, but also in proprietary trading. While the losses in proprietary trading are apparent, the losses in corporate finance are consequential losses through the loss of reputation and subsequently reduced revenue.
  - Losses may also be caused from failing in the middle office, most prominently in risk management.

→ The prestige, and the high salaries, are when working on high-risk tasks. This is what most employees seek when working in an investment bank, unless specialising in administratuve tasks from the outset. We will assume that empoyees will seek to be involve din high-risk tasks for out analysis.

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Task types

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Benefits of tasks

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Benefits of tasks

→ Investment banks have a range of roles and we will classify them into two groups, called 'tasks'.

- We assume that the completion of a high-risk task generates benefits to the bank, such as the revenue from advising clients, but also the avoidance of losses from good risk management.
- We assume that the completion of a low-risk task also generates benefits to the bank, but that these benefits are lower than from high-risk tasks. The benefits arise from a smooth functioning of the IT system to having appropriate procedures for managing staff in place and avoiding penalties from employment tribunals, for example.
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  - We assume that in order to be successful in either task, employees need to exert effort.
  - Exerting a high level of effort will have costs, such as a more stressful working environment, or longer working hours.
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  - We assume that employees can be freely moved between high-risk and low-risk tasks. While this will seem a strong assumption, it seeks to capture the idea that employees can be promoted from supportive roles (low-risk) to being involved in decision-making (high-risk) and be demoted from being involved in decision-making to a supportive role.
  - We consider there are two time periods, which might be seen as 'early career' and 'mid-career' or 'late career'.

→ We thus have two types of tasks that employees can be assigned to in each time period and we will look into the optimal way employees are allocated these tasks.

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Benefits of tasks

- If the high-risk task is successful the investment bank obtains benefits V_H

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- If the high-risk task is successful the investment bank obtains benefits V_H
- If the low-risk task is successful the investment bank obtains benefits V_L

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- If the low-risk task is successful the investment bank obtains benefits V_L
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- Employees exert effort to increase the probability of success, at some costs C

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- Employees can be freely moved between tasks

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- Employees can be freely moved between tasks and we consider 2 time periods

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Benefits of tasks

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- We assume that the completion of a high-risk task generates benefits to the bank, such as the revenue from advising clients, but also the avoidance of losses from good risk management.
- We assume that the completion of a low-risk task also generates benefits to the bank, but that these benefits are lower than from high-risk tasks. The benefits arise from a smooth functioning of the IT system to having appropriate procedures for managing staff in place and avoiding penalties from employment tribunals, for example.
-
  - We assume that in order to be successful in either task, employees need to exert effort.
  - Exerting a high level of effort will have costs, such as a more stressful working environment, or longer working hours.
-
  - We assume that employees can be freely moved between high-risk and low-risk tasks. While this will seem a strong assumption, it seeks to capture the idea that employees can be promoted from supportive roles (low-risk) to being involved in decision-making (high-risk) and be demoted from being involved in decision-making to a supportive role.
  - We consider there are two time periods, which might be seen as 'early career' and 'mid-career' or 'late career'.

→ We thus have two types of tasks that employees can be assigned to in each time period and we will look into the optimal way employees are allocated these tasks.

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Benefits of tasks

- If the high-risk task is successful the investment bank obtains benefits V_H
- If the low-risk task is successful the investment bank obtains benefits V_L
- Employees exert effort to increase the probability of success, at some costs C
- Employees can be freely moved between tasks and we consider 2 time periods

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Wage structure

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Wage structure

→ We will make some rather restrictive assumptions on the way the wages of employees are determined.

- We assume that wages are not paid after the first time period, but only at the end of the second time period.
- The size of the wages are depending on the employee's success in both time periods combined. It is thus his performance over time that is relevant for the size of his total remuneration.
-
  - While such a remuneration structure might seem highly abstract, it can be achieved by investment banks having claw-back clause in any bonus payments. Such clauses allow investment banks to reduce future bonus payments if the subsequent performance is not maintained at the same high level.
  - Boni may also be paid only with a delay once the long-term performance of an employee has been revealed. The use of options or stock as part of the remuneration package will achieve a similar result as long as exercising options or selling stocks are prevented for a longer period of time. As stocks (and options on them) are reacting to the overall performance of an investment bank rather than individual performances, this approach would be most suitable for very senior employees.
- As a simplification, we assume that the wages paid do no depend on the task that are allocated, but only on the performance of the employee. This allows us to focus our attention on the effort to ensure the task is completed successfully.

→ We can now determine the optimal allocation of tasks to employees; we will do so by backward induction, starting with the allocation in the second (final) time period, conditional on their performance in the first time period.

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- We will the task an employee is allocated if he failed in the first time period.

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Optimal effort

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Optimal effort

→ We will consider how the investment bank can maximize the effort an employee puts into completing his task successfully.

- We will now only look at the second time period, breaking down our problem into a single time period problem.
  - The first case we consider is that the employee has failed performing well in his tasks during the first time period, thus he has failed.
- The wages will now depend on whether he is successful in the task in the second time period or not.
  - If he is successful (performs to the requisite standard), he will receive the appropriate remuneration for that scenario.
  - If he is not successful (performs to the requisite standard), he will receive the appropriate remuneration for that scenario.
  - Employees face costs of effort that affects the probability of success; the more effort the employee exerts, resulting in higher costs, the higher the probability of success.
- *Formula*
- The employee will choose the effort level, expressed as the probability of success, that maximises his expected wages.
  - The optimal success rate is then given from solving the first order condition.
- In the optimum, the marginal costs have to be equal to the marginal benefits of exerting effort, which is the difference in the wage between success and failure.
- If we assume that the marginal costs are increasing in the effort level, thus the success rate, the effort level (success rate) is highest if the marginal costs are highest; this is achieved if the differential in the wages are highest.
- With banks seeking to minimize their costs, they would like to pay the lowest wages possible, while still increasing the likelihood of success. The most cost effective way to achieve the difference in wages is to set the wage for failure to zero.

→ Knowing the decision of their employees, we can now look at the profits of investment banks.

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Optimal effort

- We consider the second time period initially

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Optimal effort

- We consider the second time period initially, assuming that the employee has failed its task in time period 1
- His wages are w_{FS} ,
- Expected salary: $\Pi_M^2 =$ w_{FS}

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Optimal effort

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Optimal effort

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- His wages are w_{FS} if he is successful, if he fails again he gets w_{FF}
- Expected salary: $\Pi_M^2 = \pi_2 w_{FS} + (1 - \pi_2) w_{FF}$

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- His wages are w_{FS} if he is successful, if he fails again he gets w_{FF}, and he faces costs of effort
- Expected salary: $\Pi_M^2 = \pi_2 w_{FS} + (1 - \pi_2) w_{FF} - C_2$

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- Expected salary: $\Pi_M^2 = \pi_2 w_{FS} + (1 - \pi_2) w_{FF} - C_2$
- Employees are choosing the optimal success probability by solving $\frac{\partial \Pi_M^2}{\partial \pi_2} = 0$

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- Expected salary: $\Pi_M^2 = \pi_2 w_{FS} + (1 - \pi_2) w_{FF} - C_2$
- Employees are choosing the optimal success probability by solving $\frac{\partial \Pi_M^2}{\partial \pi_2} = 0$
- $\frac{\partial C_2}{\partial \pi_2} = w_{FS} - w_{FF}$

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Optimal effort

→ We will consider how the investment bank can maximize the effort an employee puts into completing his task successfully.

- We will now only look at the second time period, breaking down our problem into a single time period problem.
  - The first case we consider is that the employee has failed performing well in his tasks during the first time period, thus he has failed.
- The wages will now depend on whether he is successful in the task in the second time period or not.
  - If he is successful (performs to the requisite standard), he will receive the appropriate remuneration for that scenario.
  - If he is not successful (performs to the requisite standard), he will receive the appropriate remuneration for that scenario.
  - Employees face costs of effort that affects the probability of success; the more effort the employee exerts, resulting in higher costs, the higher the probability of success.
- *Formula*
- The employee will choose the effort level, expressed as the probability of success, that maximises his expected wages.
  - The optimal success rate is then given from solving the first order condition.
- In the optimum, the marginal costs have to be equal to the marginal benefits of exerting effort, which is the difference in the wage between success and failure.
- If we assume that the marginal costs are increasing in the effort level, thus the success rate, the effort level (success rate) is highest if the marginal costs are highest; this is achieved if the differential in the wages are highest.
- With banks seeking to minimize their costs, they would like to pay the lowest wages possible, while still increasing the likelihood of success. The most cost effective way to achieve the difference in wages is to set the wage for failure to zero.

→ Knowing the decision of their employees, we can now look at the profits of investment banks.

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Investment bank profits

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→ We can now determine the profits investment banks make when allocating the high-risk and low-risk task, respectively, to their employee.

- If their employees are successful, the investment bank obtains the benefits of the task they have been allocated.
- They then pay the wages, depending on the success of the employee.
- For the high-risk task they will also have to cover the losses if their employee fails to be successful in this task.

- *Formula*
- *Formula*

→ Having established the profits of investment banks, we can now determine the optimal task they allocate to their employee.

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Investment bank profits

- Investment bank obtain the benefits V_i if successful

- Low risk task: $\Pi_B^{2L} = \pi_2 V_L$
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Investment bank profits

- Investment bank obtain the benefits V_i if successful, pays the wages
- Low risk task: $\Pi_B^{2L} = \pi_2 V_L - (\pi_2 w_{FS} + (1 - \pi_2) w_{FF})$
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Investment bank profits

- Investment bank obtain the benefits V_i if successful, pays the wages, and for the high-risk task loses equity if not successful
- Low risk task: $\Pi_B^{2L} = \pi_2 V_L - (\pi_2 w_{FS} + (1 - \pi_2) w_{FF})$
- High risk task: $\Pi_B^{2H} = \pi_2 V_H - (\pi_2 w_{FS} + (1 - \pi_2) w_{FF}) - (1 - \pi_2) E$

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Task allocation

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- In order for the investment bank to allocate the low-risk task, this must be profitable.
- Using the result that the wage in case of failure is nil, the maximum wage the investment bank is willing to pay would be the benefits the tasks generates.

- We can see that increasing the success rate of a task increases the profits of the investment bank.
- [⇒] The investment bank wants the employees to choose the highest possible success rate. For this the wage differential between failing and succeeding employees has to be as large as possible, requiring banks to pay the benefits generated as wages to successful employees, making no profits themselves.
- Inserting these wages in the profits when allocating the high-risk task to the employee, the profits of the investment bank are given as in the *formula*.
- We easily see that profits are negative if the losses are sufficiently high
- [⇒] Thus if losses from failing high-risk tasks are sufficiently high, investment banks do not allocate the high-risk task to their employees.
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→ We have thus established that when failing in their task in the first time period, they will always be allocated the low-risk task afterwards. Thus an employee having been allocated a high-risk task would be demoted to a low-risk task and an employee having been allocated a low-risk task previously, would remain being allocated a low risk task.

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$\Rightarrow$ After failure, the employee is allocated the low-risk task

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- Using the result that the wage in case of failure is nil, the maximum wage the investment bank is willing to pay would be the benefits the tasks generates.

- We can see that increasing the success rate of a task increases the profits of the investment bank.
- [⇒] The investment bank wants the employees to choose the highest possible success rate. For this the wage differential between failing and succeeding employees has to be as large as possible, requiring banks to pay the benefits generated as wages to successful employees, making no profits themselves.
- Inserting these wages in the profits when allocating the high-risk task to the employee, the profits of the investment bank are given as in the *formula*.
- We easily see that profits are negative if the losses are sufficiently high
- [⇒] Thus if losses from failing high-risk tasks are sufficiently high, investment banks do not allocate the high-risk task to their employees.
- [⇒] We assume now that losses are exceeding this threshold and hence the high-risk task is not allocated to employees and thus after failing in their task in the first time period, they are allocated the low-risk task.

→ We have thus established that when failing in their task in the first time period, they will always be allocated the low-risk task afterwards. Thus an employee having been allocated a high-risk task would be demoted to a low-risk task and an employee having been allocated a low-risk task previously, would remain being allocated a low risk task.

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Task allocation

- The low-risk task must be profitable $\Pi_B^{2L} \geq 0$, and with $w_{FF} = 0$ we need $V_L \geq w_{FS}$
- $\frac{\partial \Pi_B^{2L}}{\partial \pi_2} = V_L - (w_{FS} - w_{FF}) = V_L - w_{F_S} \geq 0$

$\Rightarrow$ Investment banks want employees to choose the highest success rate and hence $V_L = w_{FS}$

- For high-risk task: $\Pi_B^{2H} = \pi_2 (V_H - V_L) - (1 - \pi_2) E$
- If $E > \frac{\pi_2}{1-\pi_2} (V_H - V_L)$, then $\Pi_B^{2H} < 0$

$\Rightarrow$ If the losses are too high, the high-risk task is not allocated

$\Rightarrow$ After failure, the employee is allocated the low-risk task

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Task allocation

→ We can now look at which task should be allocated after the employee failed in the first time period.

- In order for the investment bank to allocate the low-risk task, this must be profitable.
- Using the result that the wage in case of failure is nil, the maximum wage the investment bank is willing to pay would be the benefits the tasks generates.

- We can see that increasing the success rate of a task increases the profits of the investment bank.
- [⇒] The investment bank wants the employees to choose the highest possible success rate. For this the wage differential between failing and succeeding employees has to be as large as possible, requiring banks to pay the benefits generated as wages to successful employees, making no profits themselves.
- Inserting these wages in the profits when allocating the high-risk task to the employee, the profits of the investment bank are given as in the *formula*.
- We easily see that profits are negative if the losses are sufficiently high
- [⇒] Thus if losses from failing high-risk tasks are sufficiently high, investment banks do not allocate the high-risk task to their employees.
- [⇒] We assume now that losses are exceeding this threshold and hence the high-risk task is not allocated to employees and thus after failing in their task in the first time period, they are allocated the low-risk task.

→ We have thus established that when failing in their task in the first time period, they will always be allocated the low-risk task afterwards. Thus an employee having been allocated a high-risk task would be demoted to a low-risk task and an employee having been allocated a low-risk task previously, would remain being allocated a low risk task.

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- We can now turn our attention to the case where the initial task allocated was completed successfully.

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Initial high-risk task

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Initial high-risk task

→ We first consider a case where the employee was successful in completing a high-risk task.

- Suppose the employee is now in the second time period allocated the low-risk task.
- - We have seen above that if he were to fail in time period 1, then he would be allocated the low-risk task.
  - Therefore, whether he fails or succeeds in time period 1 makes no difference to the task allocation in time period 2.
- - In terms of the optimal wages, the same considerations apply and the wage paid is the same whether he succeeds are fails in time period 1.
  - This implies that there is no incentive for the employee to exert any effort at all in time period 1 and he will fail his task as no effort is exerted.
- [⇒] We cannot have an employee being successful in the high-risk task and then being allocated the low-risk task; instead if successful in the high-risk task, the employee will be allocated that high-risk task again.

→ As the high-risk task failing imposes losses on the investment bank, they would want to avoid failure of the task and hence would not want employees to not exert effort.

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Initial high-risk task

- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards

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Initial high-risk task

→ We first consider a case where the employee was successful in completing a high-risk task.

- Suppose the employee is now in the second time period allocated the low-risk task.
- - We have seen above that if he were to fail in time period 1, then he would be allocated the low-risk task.
  - Therefore, whether he fails or succeeds in time period 1 makes no difference to the task allocation in time period 2.
- - In terms of the optimal wages, the same considerations apply and the wage paid is the same whether he succeeds are fails in time period 1.
  - This implies that there is no incentive for the employee to exert any effort at all in time period 1 and he will fail his task as no effort is exerted.
- [⇒] We cannot have an employee being successful in the high-risk task and then being allocated the low-risk task; instead if successful in the high-risk task, the employee will be allocated that high-risk task again.

→ As the high-risk task failing imposes losses on the investment bank, they would want to avoid failure of the task and hence would not want employees to not exert effort.

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Initial high-risk task

- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards
- If failing in period 1, he is allocated the low-risk task

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Initial high-risk task

→ We first consider a case where the employee was successful in completing a high-risk task.

- Suppose the employee is now in the second time period allocated the low-risk task.
- - We have seen above that if he were to fail in time period 1, then he would be allocated the low-risk task.
  - Therefore, whether he fails or succeeds in time period 1 makes no difference to the task allocation in time period 2.
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- [⇒] We cannot have an employee being successful in the high-risk task and then being allocated the low-risk task; instead if successful in the high-risk task, the employee will be allocated that high-risk task again.

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Initial high-risk task

- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards
- If failing in period 1, he is allocated the low-risk task, hence success or failure in period 1 would make no difference

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Initial high-risk task

→ We first consider a case where the employee was successful in completing a high-risk task.

- Suppose the employee is now in the second time period allocated the low-risk task.
- - We have seen above that if he were to fail in time period 1, then he would be allocated the low-risk task.
  - Therefore, whether he fails or succeeds in time period 1 makes no difference to the task allocation in time period 2.
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- [⇒] We cannot have an employee being successful in the high-risk task and then being allocated the low-risk task; instead if successful in the high-risk task, the employee will be allocated that high-risk task again.

→ As the high-risk task failing imposes losses on the investment bank, they would want to avoid failure of the task and hence would not want employees to not exert effort.

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Initial high-risk task

- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards
- If failing in period 1, he is allocated the low-risk task, hence success or failure in period 1 would make no difference
- The considerations in period 2 after failure apply

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Initial high-risk task

→ We first consider a case where the employee was successful in completing a high-risk task.

- Suppose the employee is now in the second time period allocated the low-risk task.
- - We have seen above that if he were to fail in time period 1, then he would be allocated the low-risk task.
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Initial high-risk task

- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards
- If failing in period 1, he is allocated the low-risk task, hence success or failure in period 1 would make no difference
- The considerations in period 2 after failure apply and the employee is never allocated the high-risk task

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Initial high-risk task

→ We first consider a case where the employee was successful in completing a high-risk task.

- Suppose the employee is now in the second time period allocated the low-risk task.
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Initial high-risk task

- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards
- If failing in period 1, he is allocated the low-risk task, hence success or failure in period 1 would make no difference
- The considerations in period 2 after failure apply and the employee is never allocated the high-risk task

$\Rightarrow$ Therefore, if succeeding in the high-risk task, the employee stays in this task

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- Suppose after succeeding with the high-risk task, the employee is allocated the low-risk task afterwards
- If failing in period 1, he is allocated the low-risk task, hence success or failure in period 1 would make no difference
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Initial low-risk task

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Initial low-risk task

→ We will now look at the case where an employees had been allocated a low-risk task and has completed this task successfully.

- The outcomes in the second time period are not affected by the outcome of the task in the first time period, the two are assumed to be independent.
- Thus what has been determined for the employee successfully completing the high-risk task in the first time period also applies to the employee successfully completing the low-risk task. The successful employee will be allocated the high-risk task.
- Using the same arguments as above we get that the wages after failing in the second time period will be zero and is successful it will be the benefits of the low-risk task.
- [⇒] So we find that after failing, the low-risk task is allocated
- [] and after succeeding the high-risk task is allocated to the employee.

→ Now that we have established the task allocation for time period 2, depending on the outcome of time period 1, we can seek to determine the optimal allocation of tasks in time period 1.

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Initial low-risk task

- Which task has been allocated first is irrelevant for the incentives in the second time period

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Initial low-risk task

→ We will now look at the case where an employees had been allocated a low-risk task and has completed this task successfully.

- The outcomes in the second time period are not affected by the outcome of the task in the first time period, the two are assumed to be independent.
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Initial low-risk task

- Which task has been allocated first is irrelevant for the incentives in the second time period
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Initial low-risk task

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Initial low-risk task

- Which task has been allocated first is irrelevant for the incentives in the second time period
- If the task is successful, the employee will be allocated the high-risk task
- Similar to above, we get $w_{SF} = 0$ and $w_{SS} = V_L$

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Initial low-risk task

→ We will now look at the case where an employees had been allocated a low-risk task and has completed this task successfully.

- The outcomes in the second time period are not affected by the outcome of the task in the first time period, the two are assumed to be independent.
- Thus what has been determined for the employee successfully completing the high-risk task in the first time period also applies to the employee successfully completing the low-risk task. The successful employee will be allocated the high-risk task.
- Using the same arguments as above we get that the wages after failing in the second time period will be zero and is successful it will be the benefits of the low-risk task.
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Initial low-risk task

- Which task has been allocated first is irrelevant for the incentives in the second time period
- If the task is successful, the employee will be allocated the high-risk task
- Similar to above, we get $w_{SF} = 0$ and $w_{SS} = V_L$

$\Rightarrow$ Employees failing in time period 1 will be allocated the low-risk task in time period 2

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Initial low-risk task

→ We will now look at the case where an employees had been allocated a low-risk task and has completed this task successfully.

- The outcomes in the second time period are not affected by the outcome of the task in the first time period, the two are assumed to be independent.
- Thus what has been determined for the employee successfully completing the high-risk task in the first time period also applies to the employee successfully completing the low-risk task. The successful employee will be allocated the high-risk task.
- Using the same arguments as above we get that the wages after failing in the second time period will be zero and is successful it will be the benefits of the low-risk task.
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Initial low-risk task

- Which task has been allocated first is irrelevant for the incentives in the second time period
- If the task is successful, the employee will be allocated the high-risk task
- Similar to above, we get $w_{SF} = 0$ and $w_{SS} = V_L$

$\Rightarrow$ Employees failing in time period 1 will be allocated the low-risk task in time period 2

Employees succeeding in time period 1 will be allocated the high-risk task in time period 2

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Initial low-risk task

→ We will now look at the case where an employees had been allocated a low-risk task and has completed this task successfully.

- The outcomes in the second time period are not affected by the outcome of the task in the first time period, the two are assumed to be independent.
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- [⇒] So we find that after failing, the low-risk task is allocated
- [] and after succeeding the high-risk task is allocated to the employee.

→ Now that we have established the task allocation for time period 2, depending on the outcome of time period 1, we can seek to determine the optimal allocation of tasks in time period 1.

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Initial low-risk task

- Which task has been allocated first is irrelevant for the incentives in the second time period
- If the task is successful, the employee will be allocated the high-risk task
- Similar to above, we get $w_{SF} = 0$ and $w_{SS} = V_L$

$\Rightarrow$ Employees failing in time period 1 will be allocated the low-risk task in time period 2

Employees succeeding in time period 1 will be allocated the high-risk task in time period 2

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Initial low-risk task

→ We will now look at the case where an employees had been allocated a low-risk task and has completed this task successfully.

- The outcomes in the second time period are not affected by the outcome of the task in the first time period, the two are assumed to be independent.
- Thus what has been determined for the employee successfully completing the high-risk task in the first time period also applies to the employee successfully completing the low-risk task. The successful employee will be allocated the high-risk task.
- Using the same arguments as above we get that the wages after failing in the second time period will be zero and is successful it will be the benefits of the low-risk task.
- [⇒] So we find that after failing, the low-risk task is allocated
- [] and after succeeding the high-risk task is allocated to the employee.

→ Now that we have established the task allocation for time period 2, depending on the outcome of time period 1, we can seek to determine the optimal allocation of tasks in time period 1.

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- We will first look at a situation where the initial allocation is for the low-risk task in time period 1. Thus an employee would be promoted to a high-risk task if he has proven his ability in low-risk tasks.
- This would be the traditional approach taken by companies in most industries.

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Period 2 profits

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Period 2 profits

→ We will first assess the profits an employee allocated a the low-risk task in time period 1 would make in time period 2.

- We propose that employees failing in time period 1 would make zero profits in the second time period.
  - We propose that employees failing in time period 1 would make zero profits in the second time period.
  - By eliminating any profits in case of failure, the investment bank maximizes the incentives for the employee to exert effort in time period 1 and increase his chances of being successful and thus obtaining a profit.
- The profits are given as before in the *formula* and we can insert for the wages that $w_{FS} = V_L$ and $w_F F = 0$ and obtain the profits as shown in the *formula*.
- Solving this equation gives us the cost of efforts in time period 2.

→ We can now use this result to determine the overall profits of the employee.

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Period 2 profits

- Assume that employees failing in period 1 are making zero profits

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Period 2 profits

→ We will first assess the profits an employee allocated a the low-risk task in time period 1 would make in time period 2.

- We propose that employees failing in time period 1 would make zero profits in the second time period.
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Period 2 profits

- Assume that employees failing in period 1 are making zero profits, this ensures employees putting maximum effort into succeeding in period 1

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Period 2 profits

→ We will first assess the profits an employee allocated a the low-risk task in time period 1 would make in time period 2.

- We propose that employees failing in time period 1 would make zero profits in the second time period.
  - By eliminating any profits in case of failure, the investment bank maximizes the incentives for the employee to exert effort in time period 1 and increase his chances of being successful and thus obtaining a profit.
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Period 2 profits

- Assume that employees failing in period 1 are making zero profits, this ensures employees putting maximum effort into succeeding in period 1
- Profits in period 2: $\Pi_M^2 = \pi_2 w_{FS} + (1 - \pi_2) w_{FF} - C_2 = \pi_2 V_L - C_2 = 0$

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Period 2 profits

→ We will first assess the profits an employee allocated a the low-risk task in time period 1 would make in time period 2.

- We propose that employees failing in time period 1 would make zero profits in the second time period.
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Period 2 profits

- Assume that employees failing in period 1 are making zero profits, this ensures employees putting maximum effort into succeeding in period 1
- Profits in period 2: $\Pi_M^2 = \pi_2 w_{FS} + (1 - \pi_2) w_{FF} - C_2 = \pi_2 V_L - C_2 = 0$
- This gives $C_2 = \pi_2 V_L$

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Period 2 profits

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Period 2 profits

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→ We can now use this result to determine the overall profits of the employee.

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Period 1 profits

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Period 1 profits

→ We now determine the profits of the employee in the first time period.

- We had assumed that the employee failing in time period 1, makes zero profits.
-
  - If he succeeds in time period 1, we know he will be allocated the high-risk task in time period 2; he will then be paid some wages in time period 2, allowing him to make some profits.
  - But he also needs to exert effort in time period 1 in order to be successful in the first place.
-
  - *Formula*
  - If we insert the wages from above and the effort costs in time period 2, we see that the total profits the employee makes will be negative.
- [⇒] Allocating the low-risk task is not profitable to the employee and he would not take up employment with the investment bank if offered a low-risk task when starting his career.
- [⇒] As no employee would accept a low-risk task, the investmet bank would never seek to allocated low-risk tasks in the first time period.

→ This will leave us only with the option to initially allocate high-risk tasks to the employee; we will explore this case now.

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Period 1 profits

- If allocated the low-risk task, the employee makes zero profits if he fails

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Period 1 profits

→ We now determine the profits of the employee in the first time period.

- We had assumed that the employee failing in time period 1, makes zero profits.
- - If he succeeds in time period 1, we know he will be allocated the high-risk task in time period 2; he will then be paid some wages in time period 2, allowing him to make some profits.
  - But he also needs to exert effort in time period 1 in order to be successful in the first place.
- - *Formula*
  - If we insert the wages from above and the effort costs in time period 2, we see that the total profits the employee makes will be negative.
- [⇒] Allocating the low-risk task is not profitable to the employee and he would not take up employment with the investment bank if offered a low-risk task when starting his career.
- [⇒] As no employee would accept a low-risk task, the investmet bank would never seek to allocated low-risk tasks in the first time period.

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Period 1 profits

- If allocated the low-risk task, the employee makes zero profits if he fails
- If he succeeds, he will be allocated the high-risk task in period 2 and obtains those profits
- $\Pi_M^L = \pi_1 \left(\pi_2 w_{SS} + (1 - \pi_2) w_{SF} - C_2 \right)$

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Period 1 profits

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Period 1 profits

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- $\Pi_M^L = \pi_1 \left(\pi_2 w_{SS} + (1 - \pi_2) w_{SF} - C_2 \right) - C_1$

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- We will now look at a situation where the initial allocation is for the high-risk task in time period 1. Thus an employee would be demoted to a low-risk task if he has not proven his ability in high-risk tasks.
- This would be the approach taken by investment bank and often also management consultants.

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Optimal effort

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Optimal effort

→ We will now look at the optimal effort levels of employees in time period 1.
- Employees need to be generating profits in order to exert effort in time period 1.
- As above, the efforts are given by the same expression as reproduced in the *formula*.
- The employee will now determine their optimal effort levels in time period 1 and 2, respectively, that maximizes their total profits over both time periods.
- For notational simplicity we define the wage differential between those succeeding and failing in the second time period.
- The first order conditions solve as indicated in the *formula* for the optimal effort in time period 1
- [] as well as in time period 2, where we see that the first order condition is unchanged to our considerations in the second time period only.

→ We can now have another look at the optimal wages the investment bank pays, and will do so by first looking at the profits the bank makes across both time periods.

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Optimal effort

- To incentivize employees, they are making profits if they succeeded in period 1

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  $\frac{\partial C_2}{\partial \pi_2} = \Delta w$

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- $\frac{\partial C_1}{\partial \pi_1} = w_{SF} + \pi_2 \Delta w - C_2$

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Bank profits

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Bank profits

→ We will first determine the bank profits across time periods 1 and 2.

- The investment bank allocated the high-risk task in time period 1 and will receive the benefits if the employee is successful.
  - If the employee is not successful, the bank will suffer a loss.
- Provided the employee was successful in the first time period, he is allocated the high-risk task again in time period 2.
- In this case the same benefits are generated again if the employee is successful and if he is not successful the bank will suffer a loss. In the second time period the investment bank will also pay the wages for successful and unsuccessful employees, respectively.
- If the employee was not successful with the high-risk task in time period 1, he will be allocated the low-risk task in time period 2.
- In this case the benefits of the low-risk task are generated if the employee is successful and the investment bank will also pay the wages for successful and unsuccessful employees, respectively.
- *Formula*

→ We can now use these investment bank profits to determine the optimal wages.

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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds

- $\Pi_B = \pi_1 V_H$

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- *Formula*

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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds and loose E if it fails

- $\Pi_B = \pi_1 V_H - (1 - \pi_1) E$

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Bank profits

→ We will first determine the bank profits across time periods 1 and 2.

- The investment bank allocated the high-risk task in time period 1 and will receive the benefits if the employee is successful.
  - If the employee is not successful, the bank will suffer a loss.
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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds and loose E if it fails
- If the task succeeds, the investment bank allocated the high-risk task in period 2

- $\Pi_B = \pi_1 V_H - (1 - \pi_1) E + \pi_1 (\pi_2 V_H - (1 - \pi_2) E - \pi_2 w_{SS} - (1 - \pi_2) w_{SF})$

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Bank profits

→ We will first determine the bank profits across time periods 1 and 2.

- The investment bank allocated the high-risk task in time period 1 and will receive the benefits if the employee is successful.
- If the employee is not successful, the bank will suffer a loss.

- Provided the employee was successful in the first time period, he is allocated the high-risk task again in time period 2.
- In this case the same benefits are generated again if the employee is successful and if he is not successful the bank will suffer a loss. In the second time period the investment bank will also pay the wages for successful and unsuccessful employees, respectively.
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- *Formula*

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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds and loose E if it fails
- If the task succeeds, the investment bank allocated the high-risk task in period 2
- This tasks pays V_H if it succeeds and the investment bank loses E if it fails and pays the wages

- $\Pi_B = \pi_1 V_H - (1 - \pi_1) E + \pi_1 (\pi_2 V_H - (1 - \pi_2) E - \pi_2 w_{SS} - (1 - \pi_2) w_{SF})$

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Bank profits

→ We will first determine the bank profits across time periods 1 and 2.

- The investment bank allocated the high-risk task in time period 1 and will receive the benefits if the employee is successful.
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- *Formula*

→ We can now use these investment bank profits to determine the optimal wages.

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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds and loose E if it fails
- If the task succeeds, the investment bank allocated the high-risk task in period 2
- This tasks pays V_H if it succeeds and the investment bank loses E if it fails and pays the wages
- If the task fails, the investment bank allocates the low-risk task in period 2

- $\Pi_B = \pi_1 V_H - (1-\pi_1) E + \pi_1 (\pi_2 V_H - (1-\pi_2) E - \pi_2 w_{SS} - (1-\pi_2) w_{SF}) + (1-\pi_1)(\pi_2 V_L - \pi_2 w_{FS} - (1-\pi_2) w_{FF})$

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Bank profits

→ We will first determine the bank profits across time periods 1 and 2.

- The investment bank allocated the high-risk task in time period 1 and will receive the benefits if the employee is successful.
  - If the employee is not successful, the bank will suffer a loss.
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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds and loose E if it fails
- If the task succeeds, the investment bank allocated the high-risk task in period 2
- This tasks pays V_H if it succeeds and the investment bank loses E if it fails and pays the wages
- If the task fails, the investment bank allocates the low-risk task in period 2
- This tasks pays V_H if it succeeds and the investment bank pays the wages
- $\Pi_B = \pi_1 V_H - (1-\pi_1) E + \pi_1 (\pi_2 V_H - (1-\pi_2) E - \pi_2 w_{SS} - (1-\pi_2) w_{SF}) + (1-\pi_1)(\pi_2 V_L - \pi_2 w_{FS} - (1-\pi_2) w_{FF})$

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- *Formula*

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Bank profits

- Allocating the high-risk task, investment banks obtain benefits V_H if the task succeeds and loose E if it fails
- If the task succeeds, the investment bank allocated the high-risk task in period 2
- This tasks pays V_H if it succeeds and the investment bank loses E if it fails and pays the wages
- If the task fails, the investment bank allocates the low-risk task in period 2
- This tasks pays V_H if it succeeds and the investment bank pays the wages
- $\Pi_B = \pi_1 V_H - (1-\pi_1) E + \pi_1 (\pi_2 V_H - (1-\pi_2) E - \pi_2 w_{SS} - (1-\pi_2) w_{SF}) + (1-\pi_1)(\pi_2 V_L - \pi_2 w_{FS} - (1-\pi_2) w_{FF})$

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Bank profits

→ We will first determine the bank profits across time periods 1 and 2.

- The investment bank allocated the high-risk task in time period 1 and will receive the benefits if the employee is successful.
  - If the employee is not successful, the bank will suffer a loss.
- Provided the employee was successful in the first time period, he is allocated the high-risk task again in time period 2.
- In this case the same benefits are generated again if the employee is successful and if he is not successful the bank will suffer a loss. In the second time period the investment bank will also pay the wages for successful and unsuccessful employees, respectively.
- If the employee was not successful with the high-risk task in time period 1, he will be allocated the low-risk task in time period 2.
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- The wages are set such that the profits are maximized. Rather than using the wages after success and failure, we for convenience use the wages after failure and then the difference to the wage after success, which in combination would give us the wage after success by adding the two terms.
- We solve these first order conditions using the optimality conditions of the effort levels as determined by their employee above.
- [⇒] The two first order conditions can then be solved as in these *formulae*.
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- If $E \leq \frac{\pi_1(1+\pi_2)}{1-\pi_1\pi_2}(V_H - V_L)$ investment banks are profitable

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Success rates

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- [⇒] If our assumption that the success rate in time period 1 is higher than the success rate in time period 2 were correct, investment banks would not be profitable.
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→ We thus have established that more experienced employees will exert more effort and have higher success rates.

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Success rates

- Assume $\pi_1 > \pi_2$, then marginal costs in period 1 are higher $\frac{\partial C_1}{\partial \pi_1} > \frac{\partial C_2}{\partial \pi_2}$
- Using the employee first order conditions, we get $w_{SF} > (1 - \pi_2)\,\Delta w + C_2$ and using $\Delta w = V_H + E$, we get

$\Rightarrow$ $\Pi_B < \pi_1\,(\pi_2 V_H - C_2) - (1 + \pi_1 - \pi_1 \pi_2)\,E$

- As $\frac{\partial C_2}{\partial \pi_2} = \Delta w = V_H + E > V_H$, we have $C_2 > \pi_2 V_H$
- The first term is then negative and the second term is positive, hence $\Pi_B < 0$

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- We can now summarize the results of our models and look at some implications.

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→ The results of our model suggests that it is optimal for employees to be given high responsibilities at an early stage in their career.

- We have seen that employees are allocated high-risk tasks, thus given high responsibilities, at the start of their employment, in time period 1.
- Thus investment banks will see if they are able to be successful in those roles that generate the investment bank high benefits, but are also loss-making if not conducted successfully and only demote them if they are not able to meet their expectations. It is thus not that employees have to prove themselves in supportive tasks and learn about the roles before given more responsibility. Instead they are given responsibility and then have to prove themselves in that situation.

- We have also seen that the success rate increases over time, thus with the experience employees have.

- The incentives to increase efforts, and hence success rates, is ensure the pay accumulated in the initial time period is not lost by a failure at a later time.
- Thus the success in later time periods is very important as it decides whether the employee receives a high or low remuneration, the early time periods have a lower importance.

- The success in time period 1 ensures the employee remains in the high-risk task,
- which is the only task that generates him profits. But it is only success in time period 2 that ensures that he can actually obtain these profits.

→ Investment bankers are given high responsibilities and the threat of demotion is used to ensure they exert high levels of effort and this is pressure to exert effort maintained by delaying payment of wages until their long-term ability is known.

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- New employees are allocated high-risk tasks

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- New employees are allocated high-risk tasks and only demoted to low-risk tasks if they fail to succeed
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- The increase of the success rate is driven by the loosing the entire pay if failing in period 2

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Pressure remains on experienced employyes

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Pressure remains on experienced employyes

→ Pressure to exert effort is not only on employees in the early stages of their career, but investment banks maintain the pressure to perform, that is exert effort, also on more experienced employees.

- ▶
  - Investment bakers are given high responsibilities at an early stage and exert effort to remain in this role and at a later stage in their career, they exert effort to secure the benefits their previous efforts have built up.
  - This can be interpreted as exerting effort at an early stage to retain their job and being promoted and once having achieved a senior position, they seek to maintain their benefits.
- ▶ Having been successful in their early career, investment bankers then increase their efforts to remain in the industry as a senior level and ensure they are not sidelined into a more administrative role.
- ▶ This approach put a high pressure on investment bankers early on in their career where they are given limited opportunities to make mistakes and learn the job. Instead they are 'thrown in' and investment banks see how can 'swim' rather than build their careers up slowly and develop their skills over time.

→ What is different in investment banks and leads to this result is the central importance of effort, which is central to generating any surplus to the investment bank. The investment bank therefore looks at ways to ensure that individuals exert the highest possible effort and the threat of being demoted (or dismissed) when not successful is used to provide incentives to this effect.

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Pressure remains on experienced employyes

- Being given high responsibilities at an early stage, investment bankers will exert effort to retain these responsibilities

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Pressure remains on experienced employyes

- Being given high responsibilities at an early stage, investment bankers will exert effort to retain these responsibilities and continue to obtain high salaries

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- Being given high responsibilities at an early stage, investment bankers will exert effort to retain these responsibilities and continue to obtain high salaries
- After initial success, investment bankers will increase their efforts to ensure their careers are not jeopardised by failure

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- Having been successful in their early career, investment bankers then increase their efforts to remain in the industry as a senior level and ensure they are not sidelined into a more administrative role.
- This approach put a high pressure on investment bankers early on in their career where they are given limited opportunities to make mistakes and learn the job. Instead they are 'thrown in' and investment banks see how can 'swim' rather than build their careers up slowly and develop their skills over time.

→ What is different in investment banks and leads to this result is the central importance of effort, which is central to generating any surplus to the investment bank. The investment bank therefore looks at ways to ensure that individuals exert the highest possible effort and the threat of being demoted (or dismissed) when not successful is used to provide incentives to this effect.

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Pressure remains on experienced employyes

- Being given high responsibilities at an early stage, investment bankers will exert effort to retain these responsibilities and continue to obtain high salaries
- After initial success, investment bankers will increase their efforts to ensure their careers are not jeopardised by failure
- Investment banking put high pressure of success on career starters

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Pressure remains on experienced employyes

→ Pressure to exert effort is not only on employees in the early stages of their career, but investment banks maintain the pressure to perform, that is exert effort, also on more experienced employees.

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