# Pay and productivity, efficiency wages, ownership

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## Reading list

**10.30-12.00; 13.30-15.00 Pay and productivity, efficiency wages, ownership**

**Mandatory readings:**
Mandatory:
Borjas: Labour Economics; chapter 11: Incentive Pay

Optional:

Ehrenberg and Smith: Modern Labour Markets: Chapter 11: Pay and Productivity: Wage determination within firm

Chevalier J. and Ellison G. (1999), "Career Concerns of Mutual Funds Managers", the Quarterly Journal of Economics, Vol 114

Lazear E. (2000), "Performance Pay and Productivity", American Economic Review, Vol. 90

Niederle, Muriel and Lise Vesterlund (2007), "Do Women Shy Away from Competition? Do Men Compete Too Much?", *Quarterly Journal of Economics* 122(3): 1067- 1101.

Card, David, Alexandre Mas, Enrico Moretti, and Emmanuel Saez (2012): " Inequality at Work: The Effect of Peer Salaries on Job Satisfaction" *American Economic Review*, 102(6): 2981–3003

Brown, J. (2011): "Quitters Never Win: The (Adverse) Incentive Effects of Competing with Superstars", *Journal of Political Economy* 119(5).

Eriksson, T. and M. Pytlikova (2011): "Foreign Ownership Wage Premia in Emerging Economies: Evidence from Czech Republic", *Economics of Transition*, Vol. 19 (2), pp. 371-395.

**Further:** Slides of the lectures

All materials provided on: http://home.cerge-ei.cz/munich/labor13/

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## OUTLINE

- **Pay and Productivity:**
  - **Motivating workers**
  - **Productivity and Pay**
  - **Efficiency Wages**
- **Ownership and pay**

## Wage Determination within the Firm

- How employers design a compensation policy
- How do employers relate compensation to productivity
- Firms must choose compensation policies to obtain the right (profit-maximizing) kind of employees
- Firms have to motivate employees to take actions that advance the firm's strategy and increase its profits
- Firms must weight the costs of various policies against benefits
- Important to understand the effect of various compensation policies on workers' productivity

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## Wage Determination within the Firm

When designing compensation policies, firms must take into account that

- Workers differ in productivity, but difference hard to observe
- One worker's productivity can vary over time or between different environments
- A worker's productivity is a function of his ability, his effort and the environment
- High productivity is often related to being able to take initiatives to advance the employer's objectives

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## Motivating Workers - Overview

- The Principal-Agent Problem
- Baseline to study incentives/motivation issues
- Employment relationship –a contract between the employer (principal) and employee (agent)

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## Problem 1 - Objectives

- Difficulties in principal/agent relationships arise because the two parties' interests differ - agency problems
  - Principal cares about value he receives as a result of the agent' actions minus any payment he makes to the agent
  - Agent is concerned by what he receives from participating in the relationship minus any costs incurred by doing so
- In the absence of some mechanism to align interests, the agent will not care about the value generated for the principal

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## Problem 2: Contracts

- Could solve agency problems if employment contracts were complete
  - Would specify each party's responsibility and rights for all possible situations
  - Specify a wage payment made to the agent that depends on both the information received by the principal and the action taken by the agent
  - Principal would reward preferred actions
- But very often complete contracts not feasible
- Contracts are *incomplete* and *implicit*

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## Incomplete and Implicit Contracts

- *Incomplete* because it is impossible to stipulates each party's responsibilities and rights for each and every eventuality that could arise
- *Implicit* because agreements often too vague to be legally enforceable
- Finally, contract can often be terminated without legal penalty (especially from employee side)

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## Problem 3: Information Asymmetries

- Information asymmetries (IA) = one party knows more than the other about its own intentions or performance under the contract
- With IA, it is easier to cheat/ break the promises in the contract, e.g.:
  - Employees: work less than expected, sloppy at work
  - Employers: don't give the promised wage raise or promotion
- Breaking the contract – risk of being legally sued, but may be difficult to prove cheating
- Contracts are informal and the threat of formal punishment is absent - what to do?

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## Discourage Cheating by Signaling

- Signaling: make somebody reveal his intentions or some private information he has about himself
- Signaling prevents cheating because it gives some information to the other party
- E.g.: a firm offers a low wage at the beginning of the career and a high wage after 5 years. If a worker would accept such an offer, it would mean that he may be interested in a long term career inside that firm (if not, would take a higher wage now elsewhere)
- Signal by educational attainment or training investment, preferred type of wage scheme, …

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## Discourage Cheating by Self Enforcement

- Parties have different interests
- Opportunistic behavior: will try to advance their own interest first
- Challenge is to adopt compensation policies which self enforce both parties to stick to their promise
- Punishment if you "break a promise" on the contract (e.g.: worker is fired)
- Self enforced contract: both employer and worker derive more gains from honest continuation of the existing relationship than from severing it
- Idea of creating a surplus shared btw the worker and the firm w.r.t. alternative situations

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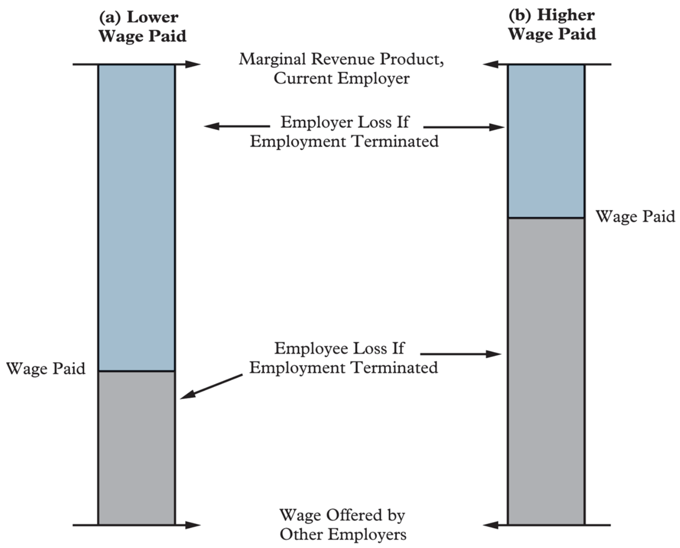
**FIGURE 1** Two Alternative Divisions of the Surplus

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## Motivating Workers

- Create rewards that give employees incentives to work hard toward goals of their employers
- Pay schemes:
- Pay for performance
  - Output based pay like piece rate
  - Problematic if weak link between effort and output
    - Risk aversion: if output influenced by external forces, worker may be subject to risk of earnings variation – most workers do not like risks
    - If the performance measure fails to capture all aspects of desired performance – quality vs. quantity -you may not get what you pay for

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## Motivating Workers

- Time based pay
  - paid for the time spent at the workplace
  - No risks for the worker
  - Creates "moral hazard" problem: why work hard if not compensated? E.g.: surfing on the internet for personal reasons,…
  - Monitoring and worker supervision may help - > may be costly and difficult to implement

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## Motivating Workers in Groups

- Workers may work in teams
- If difficult to identify the productivity of each worker, firms may rely on team incentives to motivate workers
- May lead to problems and opportunities for employers
- **Fairness**
  - People's concern about their treatment relative to others in the reference group
    - E.g. lower pay increase than collegues
    - Cut in salary vs. bonus
  - May lead to de-motivation, quits, sabotage
  - Fairness different concept for different workers

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## Motivating Workers in Groups

- **Free riding** problems /**group loyalty**
  - Enjoy benefit from other peoples work
  - Solution may be pressure of your colleagues
- Group loyalty
  - Concerned about well being of the group
  - Willing to make some sacrifice to advance the interests of the group
- Because of group considerations, motivation techniques must take account of the perceptions of fairness and issues of group loyalty.

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## Major Characteristics of Compensation Plans

- The basis on which the pay is calculated
  - Piece-rate pay
  - Commission
  - Gainsharing – group incentives plans
  - Profit sharing/bonus plans, executive pay
  - Pay for time with merit increases

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## Piece-rate Pay

- The pay of the worker is a function of the output he produces
- Can vary from 0.5% to nearly 100%
- Not that common in real world or small %
- Advantages
  - Pay directly linked to output
  - Pay increases if effort increases
  - No need for monitoring
  - Most productive workers sort into jobs with this type of pay

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## Piece-rate Pay

- Disadvantages
  - Output might not be measurable
  - Output might not be the only important goal for the firm
  - Workers might not have single control over output
  - Variability of pay (output depends on external factors)
  - Employees are risk averse,
    - firms may need to pay compensating wage differential
  - Lack of maintenance of machines and tools

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Lazear (2000)
Safelite example

Safelite Glass Corporation is the largest installer of automobile glass in the United States. Over a 19-month period beginning in January 1994, CEO Garen Staglin and President John Barlow implemented a new compensation system for auto glass installers. Dubbed the Performance Pay Plan (PPP), the new system shifted all installers from hourly pay to piece rates. Piece-rate compensation systems offer employees a fixed payment for each unit of output they produce. Safelite's piece rates varied somewhat in different locations, but on average the PPP system offered employees $20 for every windshield they installed. Like many workers under piece-rate systems, Safelite's installers were given a guaranteed minimum compensation amount; if a worker's weekly compensation from piece rates ended up below this minimum, the worker was paid the guaranteed amount.[11]

Safelite implemented PPP in an attempt to boost worker productivity. According to a study by Edward Lazear, it seems that this objective has been achieved. Analyzing detailed information on individual-level production within the firm, Lazear finds that Safelite's workers installed, on average, 2.70 windshields per eight-hour day prior to the implementation of PPP. After the switch to piece rates, this figure jumped 20 percent, to 3.24 windshields per day.

## Safelite

- Performance-based increased worker productivity at Safelite
- Performance-based pay also affected the selection (sorting) of employees who are attracted to the firm
- If workers are low and high performers, a given incentives plan like the one proposed by Safelite can attract mostly high performers (*Safelite attracted and retained fastest workers – overall increase in worker productivity by 44%, Lazear 2000)*

- However, things may not always work out…

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## Gainsharing / Group incentives plans

- Advantages
  - Often output produced in teams
  - Output and pay should then be evaluated within these teams (complementarities,...)
  - Peer pressure might eliminate shirking
  - Empirical studies find positive correlation btw team work and organizational output
- Disadvantages
  - Free rider problem
  - Wrong sorting of workers – shirkers stay, productive go
  - Variability of pay (if output depends on external factors)



## Executive Performance Pay

- Type of group incentive plan, where only the group leaders (CEO, top managers) paid according to output
- Advantages
  - Basing pay on overall firm goal: profit or stock value
  - The executive has a lot of power to influence the profit and stock value
  - Force the executive to focus on profits
- Disadvantages
  - Stock value associated with variation due to pure luck
  - Variation in pay (risks) may force firms to pay compensating wage differentials
    - High CEO pays..
  - Lead executives to pursue short run strategies and less risky projects

## Business history is littered with firms that got what they paid for

- At the H.J. Heinz Company, for example, division managers received bonuses only if earnings increased from the prior year. The managers delivered consistent earnings growth by manipulating the timing of shipments to customers and by prepaying for services not yet received.
- At Heinz, for example, prepaying for future services greatly reduced the firm's future flexibility, but the compensation system failed to address this issue.

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## Pay for Time with Merit Increases

- Merit pay – award larger pay increases to workers whose supervisors rate them as better performers
- Advantages
  - Stable pay
  - Easy to measure (only need to rank workers and reward them)
  - Focus on more soft values as service and quality
- Disadvantages
- Incentive for shirking
- Monitoring necessary
- Merit increases (better pay to workers rated as good performers)
  - A measure to base the monitoring on
  - Relative ranking – sabotage
  - Workers spend time "marketing" themeselves
  - Decrease cooperation

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## Motivating Workers: Level of Pay and Productivity

- Why higher pay may increase productivity:
- Attract better workers
  - Enlarge the firm's applicant pool: can be more selective
- Build employee commitment
  - Employees less likely to quit
  - Firms offer therefore more training
- The cost of loosing the job is higher -> less shirking
- "Fair play" - Perceptions of equity
  - Workers will pay back with higher effort, where as the opposite might results in shirking or sabotage

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## Efficiency Wages

- Another way firms can link employee's reward to performance is through the threat of firing
- Firing is a punishment if wages are higher than what is available in the market (or if it is costly to find a new job, i.e. takes time and effort)
- If a worker shirks, he can be detected and fired
- Can motivate hard work (not shirk) by making the job inside the firm more valuable - increase inside wage
  - Only possible if workers expect long-term employment relations/existence of some unemployment, structured labour markets

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## Efficiency wages

- A wage above the market clearing wage, where the marginal revenue from increasing the pay equals the cost of this pay increase.
- Hence, assumes that increased pay will increase productivity and thereby revenue.
- Implications:
  - Might result in unemployment
  - Similar workers are paid differently

- Applied by firms who want long-term relationship with their employees
- or who find it hard to motivate workers by output based pay.

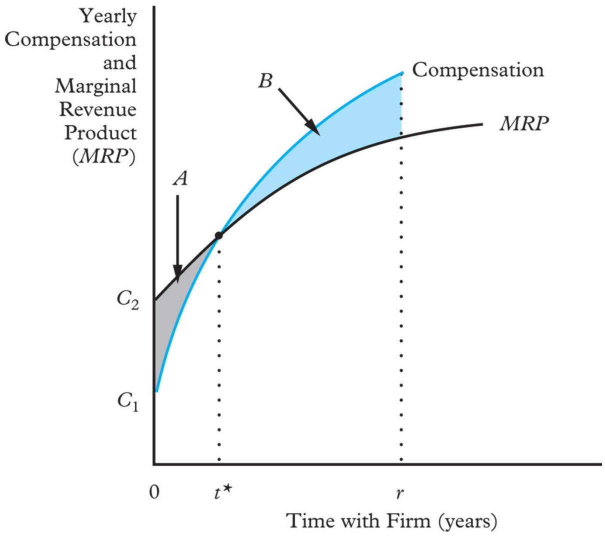
- Example of Ford –doubling of wage in 1914- quit rate fell by 87%, absentee rate fell by 75%, morale and productivity increased -> increase in profitability

## Motivating Workers: Productivity and the sequence of pay

- Internal labour markets -> career options within the organisation
- Underpayment followed by overpayment
  - Sorting: attracts more stable workers
  - Incentives: workers provide high effort in order to refrain from being fired before the reward is paid -> less monitoring needed.
  - more likely in jobs in which close supervision not feasible.

**Figure 2:** A Compensation-Sequencing Scheme to Increase Worker Motivation

Implication: PV(A) = PV(B)




## Sequence of pay

- Risks:
- Employees: might be fired or firm goes bankrupt before *r*, hence before full reward is paid
- Employers: older ”overpaid” workers might stay too long after *r*. Firing them will signal that the firm’s wage policy cannot be trusted.

## Workers motivation: Promotions

- Promote workers who performed really well in lower-level jobs (incentives) or who possess skills valuable in higher-level jobs (selection)
- Most common promotion system is when promotions take the form of a **tournaments** - a set of workers compete for a promotion and only the “winner” is promoted
- **Standard** promotion – if a worker reaches a given threshold of performance, he receives a promotion (no winner aspect)

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## Promotions

- Promotion is often associated with a wage and/or status increase
- Therefore, employees have strong incentives to increase their likelihood to be promoted
- Working hard today increases your probability to be promoted tomorrow
  - E.g. in sports (risk of injury), in corporate world (parents sacrifice time with their children),…

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## Tournaments Promotions

- When performance is hard to evaluate, even by supervisor but when it is feasible to rank individuals
- Mostly used for internal promotions, like CEOs
- Promote the agent who is perceived as having performed best is a strong ex ante incentive provision tool
- Then the contest looks like a tournament: employees compete and the best one gets the prize (= promotion)
- Relative performance evaluation – your rank depends on what the others have done
- Therefore it insures workers against common risks

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## Tournaments Promotions

- Advantages:
- Contestants put more effort the higher the expected benefits
- Expected benefits increase with the value of the prize and the probability to be promoted
- More competitive workers will be attracted by this type of promotion (sorting aspect)
- Disadvantages
  - You need to promote somebody (even if they are all bad) – bad for selection
  - Sabotage issue to lower the performance of others
  - After the winner is announced, no incentives left if no further promotions -> effort might decrease.
  - Women less likely to enter tournaments (Niederle&Vesterlund, QJE2007)

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## Standard Promotions

- When performance is easy to evaluate by supervisors
- Promote the worker if his performance reaches a given level
- You need flexibility in the hierarchy of your firm *(imagine all employees of level 2 reach this year the threshold, what happens?)*
- The probability of being promoted depends only on your performance, no effect of what the others have done
- Workers face risk
- No sabotage
- Can be better for selection because you can choose not to promote workers this year

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## Career Concerns

- In certain jobs, an important source of incentives is employees' career concerns
- Employees undertake current actions that enhance their future value in the labor market
- Employees want to keep their future prospects bright

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## Distortion of effort

- Young inexperienced workers
- Why would it be bad for a young manager to perform badly? Why would the firm punish him and not the older one?
- Idea is that over the career of a worker, firms learn the “ability” (quality) of the worker
- When a worker is new, the firm does not know if he is good or bad: a bad info will tend to make the firm think the worker is bad
- When he is older, there has been already a lot of info for the worker, a bad one is weighted with all the previous good ones

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## Where Does it Come From?

- Like an average, the more values you have, the less weight you give to small values (i.e. bad years)
- The value of new info decreases with time (over the career)
- Incentives are very strong at the beginning of the career, not so much at the end
- Sometimes, career concerns may provide better incentives than pay for performance rewards (Professional athletes)
- Sometimes may also provide incentives where output based pay would be difficult to adopt (Academia)

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## Application 1 – Why do Large Firms Pay Higher Wages

- Us: workers in 500+ firms earn 21% more than workers in 20- firms
- Wage rise also faster with experience in the largest firms
- Why?
- Most explanations rely on the idea that larger firms need better workers and/or have better opportunities to make their workers more productive

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## Why do Large Firms Pay Higher Wages

- Economies of scale in job training
- Interdependent work processes => disciplined workers
- Job vacancies are more expensive for large firms => have to pay higher wages
- Better at allocating workers efficiently
- Long term attachment more attractive in larger firms, hence more possibility to motivate through different pay schemes

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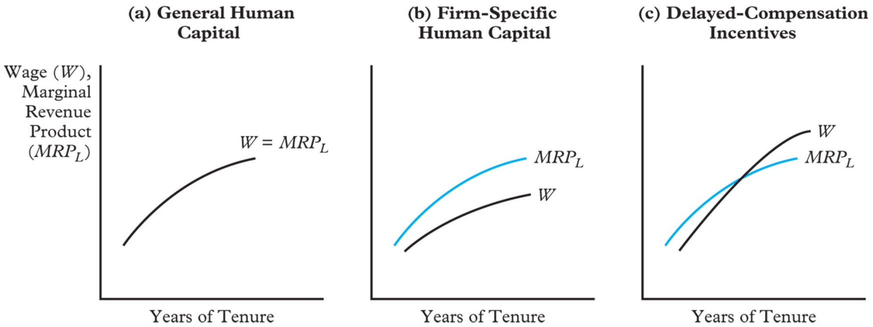
## Application 2 – Why wage increases with tenure?

- Three explanations:
  - General human capital combined with good matches
  - Firm-specific human capital
  - Delayed-compensation incentives

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***Next – an empirical paper on ownership, wages and productivity:***

## Foreign Ownership Wage Premia in Emerging Economies: Evidence from Czech Republic

**Tor ERIKSSON & Mariola PYTLIKOVA**

Eriksson, T. and M. Pytlikova (2011): "Foreign Ownership Wage Premia in Emerging Economies: Evidence from Czech Republic", *Economics of Transition*, Vol. 19 (2), pp. 371-395.