

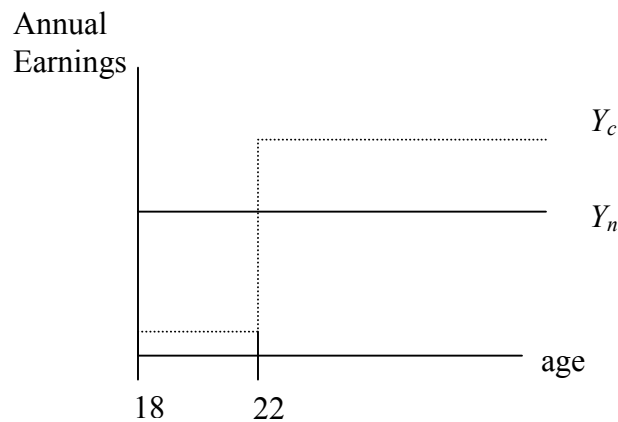
THE ECONOMICS OF TRAINING

1. Warmup: Education as an investment
2. General Training
3. Firm Specific Training
4. The “Holdup” Problem
5. Multiskilling and Japanese firms
6. Alternative Skills and Unions

1. Education as investment.

Example: Human Capital

- 4 year college
- Ignore nonpecuniary aspects of education
- Maximize Present Value of lifetime income
- Y_c earnings per year if attend college
- Y_n earnings per year if do not attend college



- Decision is made at age 18
- Work until age 60
- r - Real discount rate
- T - tuition cost
- Zero earnings during college
- The key is to compare PV_c vs. PV_n

$$PV_c = \sum_{t=22}^{60} \frac{Y_c}{(1+r)^t} - T \quad \text{vs.} \quad PV_n = \sum_{t=18}^{60} \frac{Y_n}{(1+r)^t}$$

- Relative attractiveness of attending college increases:
- i) With increases in the college wage premium Y_c/Y_n
 - ii) Individual's ability to learn

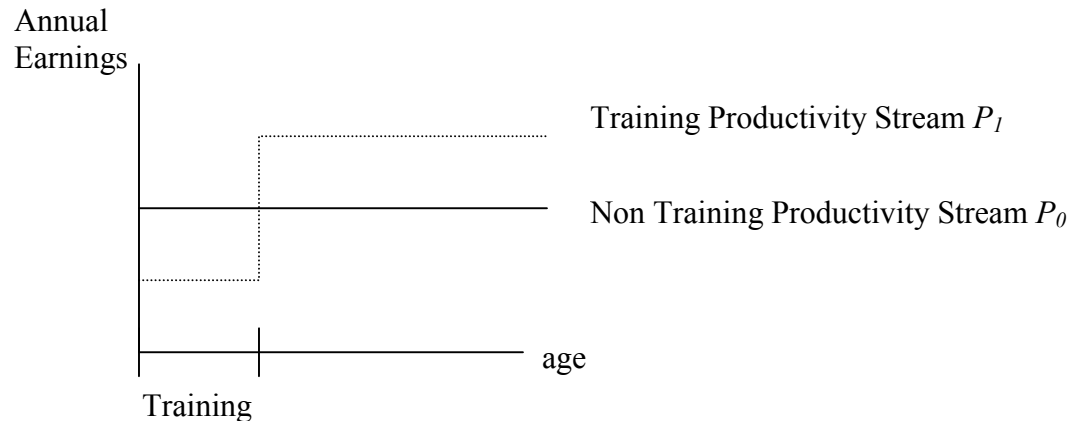
- Relative attractiveness of attending college decreases with:
 - i) Tuition increases
 - ii) Expected labor force interruptions
 - iii) Age
 - iv) High discount rate
 - Returns are in the future
 - Costs are in the present
 - Rate of return on alternative investments
 - Borrowing Costs

2. General Training

a) Costs of training: 1. fees (tuition) 2. forgone productivity (of both the trainer and trainee) 3. mistakes

b) Let's attempt to maximize the worker's lifetime productivity, considering the following factors:

1. Relative productivity of trained (P_1) and untrained labor (P_0)
2. Costs of training
3. Labor force attachment
4. Discount rate
5. age (years remaining in the market)



c) Who pays for general training?

Three options:

- i. Firm pays: Wages equal P_0 during training period and same after training. After training, the worker can better more outside the firm, since his productivity P_1 is now higher. The workers is likely to quit and the firm takes a loss.

- ii. 50%-50% sharing: Note that even now, the firm is still vulnerable to quits. Wage before training ends equals $P_1 + .5(P_0 - P_1)$, and after training equals $P_0 + .5(P_1 - P_0)$.
- iii. Worker pays the full costs of training and reaps the full rewards. Wages are P_1 both after and before training. Poaching is not a problem, and even if it is, *it does not damage the firm*.

Hence: The optimal result is for the worker to pay for any investment in general training and reap the full benefits from it in the form of a higher post-training wage.

3. Firm Specific Training.

- a) Who pays for firm specific training?
 - i. Firm pays for training (wage is the non training productivity stream). The firm is vulnerable *ex post* for two reasons. The first one is that workers are likely to quit in response to small variation in her outside options, causing the firm a big loss. The second one is that the worker has all the bargaining power.
 - ii. Worker pays for training (wage equals the training productivity stream). Here two things occur that threaten the worker. She is going to be very vulnerable in the post-training period to small variations in productivity: if her output is $P_1 - \epsilon$, for $\epsilon > 0$ the firm will want to lay off the worker. Also, the firm in this situation has all the bargaining power.
 - iii. Shared investments & costs: This is the optimal policy, where the wage will be: $W = (1 - \theta)P_1 + \theta P_0$, where $0 < \theta < 1$ is the percentage that the firm pays.

4. Firm-specific training and the “holdup problem”.

The higher firm specific productivity generated by firm-specific training generates what economists call “quasi-rents”, or a surplus, that needs somehow to be divided between the firm and the workers. The hold-up problem is a problem that affects the incentives to make firm-specific investments whenever the parties know there will be bargaining over the surplus that is generated.

Example. Table 1 gives an example for the case of investment in *physical* capital by the firm. Even though the investment yields a greater level of social welfare, the bargaining process makes the investment decision unattractive. Solutions to the holdup problem: either set tomorrow’s wages in advance or secure cost sharing in advance.

Table 1

	W/o investment	w investment
Worker’s productivity	20,000	40,000
Investment cost	0	15,000
Alternative wage	20,000	20,000
Wage under “split the diff”	20,000	30,000 ¹
Profits	0	-5,000 ²
Profits+wages	20,000	25,000

Lessons from the “hold-up” problem, for investments in firm-specific skills as well as other cases of relationship-specific investments:

- b) Anticipate the future bargaining power of your partner.
- c) Consider your partner’s stake in future negotiations.
- d) Secure cost sharing, set wages in advance.
- e) Understand your partner’s concern about her future vulnerability.

5. Multiskilling and the Japanese firm (Carmichael & McLeod, 1993).

In Japan firms apply what is known as the “New Human Resource Management Paradigm”:

- Longer training
- Multiskilling
- Lifetime employment
- Few job descriptions
- Wages are tied to people, not to jobs

What do these do:

- Flexibility
- Reduces worker’s opposition to technological change
 - Workers make investments in specific skills
 - Much less resistance to process innovation.

¹ 30,000=.5*40,000+.5*20,000

The Carmichael and McLeod story is that multiskilling makes workers more receptive to technological change. Technological change, multitasking and lifetime employment all go together.

6. Alternative Skills and Unions (Kuhn and Sweetman, 1999)

Kuhn and Sweetman introduce a third type of skills: alternative skills. These are useful only *outside* the current firm. KS argue that the alternative skills are more likely to become atrophied among unionized workers. The reason is that (a) these jobs are expected to be secure, and (b) they are usually narrowly defined (i.e. *not* multiskilled), hence employees will not have incentives in investing to keep these skills.

The lessons from here are:

- For workers: be sure of job security before you let your alternative skills atrophy.
- For firms: can expect workers with high tenure, narrowly defined jobs and historically strong job security to fight hard to keep job security (“job security trap”).