



# Economics 136

## Chapter 4 Learning A

### Worker's Productivity

#### (Part I)

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Appendix: You are responsible for  
midway page 94 to page 95 but  
not the earlier material.

# KEY QUESTIONS



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- 1) Who knows more about a worker's productivity, worker or firm?
- 2) Worth it to spend to find out worker productivity?
- 3) Useful to get info on how to assign workers to right job **WITHIN** firm?
- 4) What if results of firm's screening "leak" to other firms?
- 5) Can't screening discourage workers from applying?!
- NOTE: This chapter implicitly assumes that no adverse selection in hiring so applicants representative of overall population.

# 1) Who knows more about a worker's productivity, worker or firm?



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- Could be either.
  - Worker knows more about his talents but...
  - firm may know more about the worker-job "fit".



## 2) Worth it to spend to find out worker productivity?

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- Depends crucially on how much workers vary in productivity.
  - If small variations, costs of screening (through interviews, testing etc.) may outweigh benefits.
- Book gives 2 examples:
  - i) commercial banking (e.g. bank tellers) -- probably not huge variations in productivity so spend only a bit on screening
  - ii) Investment banking -- huge variations in ability to "close a deal." Gains from screening could be large.



# An Investment Banking Example of the Value of Screening

- Pay \$40 per year.
- Assume can hire any # of workers, so max  $\pi$ /worker.
- Revenue streams:

Type:	A	B	C	D	E
Proportion of population: (p)	0.1	0.2	0.3	0.3	0.1
Average revenues (R):	-100	0	50	100	200



# What are expected profits per worker if don't test?

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- Exercise: Show that expected revenues if you hire at random from the population (that is, average revenues) will be \$55 per worker
  - Hint: Remember the definition of an expectation: it's just a weighted average of all the possible outcomes, with weights = probabilities  $p$ .

# If don't test, then Expected $\pi/\text{worker tested} = ?$

- $E(\pi/\text{worker}) = \text{average revenues} - \$40 = \$15.$
- Now, what if could test each worker for \$1 and learn which type they were? What proportion of workers would you hire and what would expected profit per worker HIRED be?
- Because wage = \$40, don't hire A and B types. We will therefore on average hire 0.7, or 70% of the workers we test.
  - $E(\pi/\text{worker tested})$
  - =
  - = (\$\_\_\_\_\_/worker tested)



# What about expected $n/(\text{worker hired})$ ?

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- On average hire only 70% of interviewees, but must consider the costs of testing the A and B types not hired.
- **Example: if we tested 10 applicants on average we would hire 7 of them.**
- Total  $E(n) = 10$  tested workers \* ( $E(n/\text{tested worker}) = 10(\$36) = \$360$
- Divide this overall profit by the number of workers we will hire on average:
- $E(n/\text{worker hired}) =$



# Is there a way to increase $E(n/\text{worker hired})$ ?

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- Textbook does not consider the possibility of using the test to hire only the type E workers.
  - Exercise: Prove that  $E(n/\text{worker hired})$  almost triples to \$150 if you use the test to hire only the type E workers!

Then why in practice would an employer not use testing to reject all but the very most productive workers?

- Probably, the costs of identifying very best workers probably much higher than costs of identifying just the very worst.

Revenues (R), Costs (C) from Testing



Increasing stringency of test →



# General Lessons on When Worthwhile to Screen Applicants

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- 1) If screening costs small
- 2) If large variations in worker ability
  - (...so...  
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- 3) If % of applicants who are highly unproductive is large
  - Example of points 2 and 3:



# Temp Agencies

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- Temporary help agencies (temp agencies) act as intermediary between workers and firms that need temporary help. Read pp. 80-81.
  - Provides firms with explicit trial period without obligation
    - If firm wants to keep worker, they can't just "poach" him or her – must pay a fee to temp agency
- David Autor: temp agencies provide "free" training. WHY?
  - Answer: \_\_\_\_\_