Test 2
Economics 136 – Human Resources
Spring 2012
Prof. Julian Betts

May 17, 2012

Name: _____

Student ID _____

There are 4 written problems in this test, worth a total of 49 points. Please write neatly. If you place the answer to a question in an odd place, such as the back of the page, please indicate this clearly, for the sake of the graders.

If you use pencil, the exam cannot be regraded. If you do submit your test for regrading, you must do within the time and other guidelines listed in the syllabus.

SHOW ALL YOUR WORK!

You have 80 minutes. Good luck.

For the graders:

1. _____/6
2. _____/8
3. _____/17
4. _____/18

SUM _____/49

STUDENT CONSENT FOR RELEASE OF STUDENT INFORMATION
(Buckley Waiver)

I hereby authorize the UCSD Economics Department to return my graded final examination/research paper by placing it in a location accessible to all students in the course. I understand that the return of my examination/research paper as described above may result in disclosure of personally identifiable information, that is not public information as defined in UCSD PPM 160-2, and I hereby consent to the disclosure of such information.

Quarter_____ Course_____ Date_____

Instructor_____

Student ID#_____

Print Name_____

Signature_____

1. (6 points) Information technology (IT) has long been predicted to change the workplace. What sorts of tasks traditionally done by workers are being replaced by machines and computers? What sorts of skills are becoming more important for workers to possess?

2. (8 points) Suppose that a firm decides that a team of 3 workers should share in the revenues they generate. Revenues = $E_1 + E_2 + E_3$ where E_i is the effort of worker i. (The workers are part of a team because the manager cannot see who is exerting how much effort – all the manager sees is the final revenues generated.

a) If each worker receives

Pay = Revenues/3

and each worker has a utility function

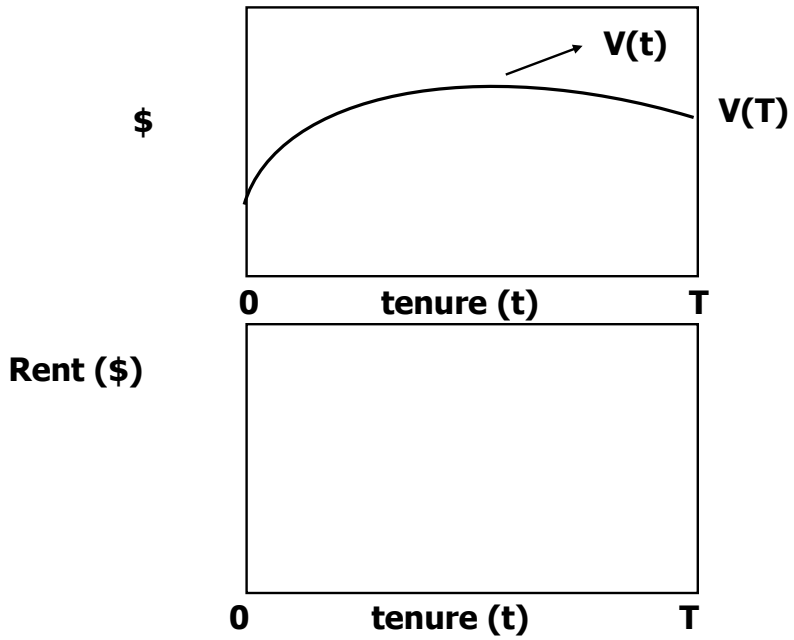
$U = Pay - E^2$

What is the worker's optimal effort level? Show your work and verify that you have the solution that maximizes utility. (3 points)

b) Now suppose that the manager figures out a way to observe each worker's effort directly and instead sets pay for worker i equal to E_i. Work out worker i's optimal level of effort in this case. Is it higher or lower than in part a)? What is the economic term for the problem of teams that you have just identified? (5 points)

3. (17 points) Suppose that a firm gives firm-specific training to workers during the early part of their career with the firm. The value marginal product of a typical worker is shown below.
a) In the top graph plot a possible profile for wages W(t) at the firm and explain in a sentence or two. (3 points)

T is retirement date, V(t) is Value Marginal Product at time t



b) If the interest rate is r mathematically define Rent at the start of some period t. Draw a likely profile for Rent on the bottom graph above. Explain in a few sentences why Rent against tenure t has the shape that it does. (8 points)

c) Suppose that a short recession hits, and V(t) drops somewhat for a few periods. Draw a line for "Rent*" in the bottom figure above showing what could happen to rent in this situation. Please label it Rent*. (3 points)

d) Whom should the firm most likely lay off in case of a recession? Are there legal considerations in deciding whom to lay off? Be specific. (3 points)

4. (18 points) A firm is trying to establish a wage =a+bE where E is worker effort and a and b are to be chosen by the firm. The worker maximizes utility which is given by wage $-0.5E^2$
or $U = (a+bE) - 0.5E^2$, where the latter term reflects the cost of effort to the worker. The firm's output is given by Q=3E. The product sells for $5 per unit. Each unit of output requires $1 in material costs.
a) Assume that the worker's utility must be at least zero for him or her to accept the job. Calculate the profit maximizing values of a and b, and the optimal effort E and profit π that results. (14 points)

b) (4 points) In a) above we assumed that the worker had to receive utility of at least 0 in order to accept the job. But the economy changes and now to attract workers it must set U=12. How will the optimal values of a, b, E and π change as a result? (Hint: You can save a lot of math by looking carefully at the math and the logic behind your answer to a) and then writing down what does and does not change, and why.) You should list the new values for a, b , E and π.