STOCKHOLM UNIVERSITY
Department of Economics

Course name:	**Labour market economics**
Course code:	**EC2102**
Examiners:	**Ann-Sofie Kolm and David Seim**
Number of credits:	**7,5 credits**
Date of exam:	**Thursday, 20 August, 2015**
Examination time:	**3 hours**

Write your identification number and the number of the question on every cover sheet. Do not write answers for more than one question in the same cover sheet. Explain notions/concepts and symbols. Only legible exams will be marked. No aids are allowed.

The exam consists of 6 questions. One can get 100 points in total. For the grade E 40 points are required, for D 50 points, C 60 points, B 75 points and A 90 points.

If you think that a question is vaguely formulated: specify the conditions used for solving it.

Results will be posted September 10 at the latest.

Good luck!

Q1. (20 points) Consider a profit maximizing firm producing a product by use of capital and labour. Although the firm can use both capital and labour as inputs, and it is fairly easy to substitute between these inputs, the firm relies heavily on labour when producing the output. There are no similar products on the market. Discuss which factors facing this firm are likely to make its demand for labour more/less sensitive to wage changes. Motivate your answer.

Q2. (10 points) Discuss labour supply over the business cycle. Describe the hypotheses of the *added worker effect* and the *discouraged worker effect*. Relate these hypotheses to real world observations. Does empirical evidence suggest the labour force participation is procyclical or countercyclical? Motivate.

Q3. (20 points) Consider a case where the demand side on the labour market is represented by the following demand function: $N = w^{-\frac{1}{(1-\alpha)}}$, where w is the wage, N is the number of employed workers, and α <1 is a positive technology parameter. In accordance with the monopoly union model a wage setting curve (*WS*) can be derived and given by: $N = k\left(1 - \frac{1-\alpha}{1-\frac{B}{w}}\right)$, where k is a positive constant, and B is unemployment insurance.

a) Draw the wage setting curve (*WS*) and the labour demand curve (*LD*) in a figure with employment (*N*) on the *X*-axes and the wage (*w*) on the *Y*-axes. (7)
b) Use the equations for the labour demand and the wage setting and its corresponding figure to show how employment and the wage change when *B* increases. (7)
c) Carefully motivate your answer in *b*). (6)

Q4. (20 points) Consider an individual who chooses a job based on its wage, denoted by *w*, and riskiness, *r*. Her preferences are given by: $U=u(w,r)$, where *u* is increasing in *w* and decreasing in *r*. Assume also that a firm maximizes profits, given by $\Pi = \pi(w,r)$, where π increases in *r* and decreases in *w*. *w* and *r* are continuous.

a) Draw an indifference curve of the individual that satisfies the preference-assumptions above. (7)
b) In a separate figure, draw an iso-profit curve of the firm that satisfies the assumptions above. (7)
c) Suppose we add two assumptions: (i) diminishing marginal utility of consumption, i.e. that *u* is increasing in *w* at a decreasing rate and (ii)

diminishing returns to riskiness, i.e. that π increases in r at a decreasing rate.

Draw the resulting indifference and iso-profit curves in one diagram. Show how in equilibrium, wages and job risks move together. (6)

Q5. (20 points) Consider a government that contemplates extending the mandatory school system from nine years to ten years in primary school. You are now asked to give recommendation about the implementation and are thinking about estimating the model:

$$Y_i = b_0 + b_1 \, sch_i + e_i$$

Where Y_i is the outcome (e.g. wage) of individual i, and sch_i is the years in school of the same individual. e_i is an error term.

a) Illustrate mathematically and in words why estimating this model can give rise to *Omitted variable bias*. (7)
b) If you had no financial or ethical restrictions, explain what research design you would use to uncover b_1? (7)
c) Explain the research design that Meghir and Palme (2005) use in their paper to estimate b_1? (6)

Q6. (10 points) Suppose you are choosing a career path with two options. Either you study before entering the labor market, or you enter the labor market directly. You only live in two periods, today and tomorrow. If you study, you incur tuition fees of $10,000 today, but earn $100,000 tomorrow. If you enter the labor market directly, you earn $10,000$ now and $70,000 in the second period.

a) Let the interest rate between these periods be given by r. State the condition under which you will study. (5)
b) Derive the r-value that makes you monetarily indifferent between studying and entering the labor market directly. (5)