Final Exam ECON4715 – Labour economics

This exam has 4 questions, with in total 13 sub-questions.
All questions are weighted equally.
When answering the questions on the exam you should be brief and to the point!
Make sure to write legibly, difficult to decipher answers will not be counted!

Below answer solutions are suggested. More in general, answers that deviate from the ones suggested below will be rewarded as long as they rely on economic sound and consistent argumentation.

1. In this question you have to indicate whether you think the statement is true or false and explain why. You do not get any points if you only state whether the statement is true or false.

   (a) The Earned Income Tax Credit will affect labor supply only at the extensive margin.

   Solution hint: False. Draw budget constraint. You can the show that individuals who do not work the EITC can affect their labour supply at the extensive margin. For those who supplied a positive amount of hours there will be income and substitution effects that potentially reduce their hours of work and therefore affect labor supply at the intensive margin.

   (b) The supply of labor will not change if all prices and wage rates increase by the same percentage.

   Solution hint: True. The first-order condition in a simple static labor supply model is U_c / U_l = p / w. So if p and w change in the same proportion labor supply does not change.

   (c) The introduction of a minimum wage can have positive effects on employment.

   Solution hint: True. Monopsony employer (see lecture slides).

   (d) Omitted variable bias in estimates of returns to schooling is always positive.

   Solution hint: False. Possible counter example: measurement error.

2. Migration

(a) Explain from a theoretical point of view how migration affects the wages of native workers.

Solution hint: Depends of whether native workers are substitutes or complements. See lecture slides.

(b) Analyze the selection of migrants using the Roy model. Show when migrants will be positively selected, and when they will be negatively selected. Can both positive and negative selection occur at the same time? Explain.

Solution hint: Use the simple roy model in Borjas (Figure XX).

(c) Empirical research has used spatial research designs to investigate the impact of migration on the labour market outcomes of natives. Explain the main idea behind these approaches, what they tend to find and how to interpret these results.

Solution hint: Spatial research design compare different labor markets at a same point in time. Borjas gives the examples of different LA and Pittsburgh. The main idea is to compare the local labor market before and after the inflow of migrants in one city to another city that did not experience a similar labor supply shock. So a DID type setup where the comparison city acts as a counterfactual (through the common trend assumption). These studies typically find little in the way of effects of immigration on the labour market outcomes of natives. One explanation is that native workers respond to these shocks by moving to other and better local labor markets. This would attenuate the impact of the migration induced labor supply shock.

3. This question is about Aggarwal, R. K. and A. A. Samwick. (1999). The Other Side of the Trade-off: The Impact of Risk on Executive Compensation. *Journal of Political Economy*.:

   (a) Explain the source and intuition behind the fundamental trade-off in a principal-agent model.

Solution hint: The source of the principal-agent problem lies in an information asymmetry: There is a risk averse agent who knows his own effort, but the principal only observes the agent's performance which is a noisy signal of effort. Thus, contracts cannot be made contingent on effort, only on performance. The firm would like to offer a wage which only depends on performance since this provides the agent with the optimal incentive to put in effort. The agent on the other hand prefers a fixed wage since a piece rate exposes him to uncertainty (the noisy part of performance) which he dislikes. The risk neutral firm can therefore insure worker by offering a wage contract that is part performance part fixed wage. And since the agent is willing to pay for the insurance, the optimal contract therefore lies somewhere in between full insurance and no insurance. This illustrates the trade-off in the model between incentives and insurance. Without the asymmetric information there would be no such trade-off: The contract could be made contingent on effort. This provides the optimal incentive and does not expose the agent to risk.

   (b) Solving a traditional principal-agent model, the authors find the solution for the performance-pay related component of the optimal contract:

   $$\alpha_1^* = \frac{1}{1 + rk\sigma_e^2}$$

   Explain why the optimal pay-performance is decreasing in r, k and σ_e^2.

Solution hint: r is the risk aversion of the agent. More risk averse agents dislike uncertainty the optimal contract has a smaller performance-pay related component and a larger fixed component. k is the agent's cost of effort. If the cost of effort is higher, the agent will require more compensation to be willing to provide this effort. Therefore, incentives are less efficient, and the optimal contract has a smaller pay-performance component. σ_e^2 is the riskiness of the firm, or the standard deviation of the shock to firm performance. Risky firms, where performance vary a lot independently of effort, therefore provide less stable incomes for the agent if the pay-performance component is the same. Since she is risk averse, she must be compensated for this by having a lower pay-performance component.

   (c) The article's main results are given in the table below (change in wealth is measured in thousands and performance is measured in millions of dollars). Does column (1)

in this table support the principal-agent model? Why or why not?

Solution hint: The table does indeed support the predictions of the principal-agent model. We see that good performance is rewarded in the form of CEO compensation: γ_1 tells us that CEO wealth increases by 28,000 USD for each million of firm performance. This is consistent with some sort of pay-performance related contracts. Furthermore, γ_2 shows us that the pay-performance component is smaller in risky firms (firms with high σ): For the most risky firms, there is no evidence of pay-performance at all, since the negative γ_2 cancels out the positive γ_1. This is in line with the expression for optimal pay-performance component from part b)

MEDIAN REGRESSION ESTIMATES OF PAY-PERFORMANCE SENSITIVITIES FOR MEASURES OF FIRM-SPECIFIC WEALTH, 1993–96

	Chief Executive Officers		Other Executives	
	Change in Wealth (1)	Excluding Existing Options (2)	Change in Wealth (3)	Excluding Existing Options (4)
	A. Dollar Returns			
	Coefficients from Median Regressions			
γ_1 performance	27.596	12.550	6.008	2.145
	(1.983)	(.766)	(.140)	(.091)
γ_2 performance × CDF of variance	−26.147	−11.920	−5.427	−1.923
	(2.093)	(.837)	(.154)	(.101)
γ_3 CDF of variance	2,710	2,327	1,134	1,052
	(180)	(110)	(26)	(27)

4. This question is about Arcidiacono, P., P. Bayer, and A. Hizmo. (2010). Beyond Signaling and Human Capital: Education and the Revelation of Ability. *American Economic Journal: Applied Economics*. The authors main results are given in the following table:

TABLE 2—THE EFFECTS OF AFQT ON LOG WAGES FOR HIGH SCHOOL AND COLLEGE GRADUATES

	High school		College		Test: College=HS *P*-values	
Model	(1)	(2)	(3)	(4)	(5)	(6)
Standard. AFQT	0.0060	0.0078	0.1485**	0.1420**	0.000	0.000
	(0.0130)	(0.0129)	(0.0350)	(0.0354)		
AFQT × exper/10	0.1261**	0.1183**	0.0122	0.0198	0.026	0.050
	(0.0176)	(0.0173)	(0.0480)	(0.0472)		
Black	−0.0628**	−0.0483*	0.1098*	0.1125**	0.006	0.007
	(0.0267)	(0.0259)	(0.0563)	(0.0543)		
Black × exper/10	−0.0358	−0.0340	−0.1304*	−0.1264*	0.223	0.255
	(0.0350)	(0.0345)	(0.0694)	(0.0677)		
R^2	0.1631	0.1874	0.1678	0.1821		
Observations	11,795	11,772	4,112	4,112		
Additional controls	No	Yes	No	Yes	No	Yes
Experience measure: Years since left school for the first time <13						

Assume the AFQT is a perfect measure of ability.

(a) Is there evidence of discrimination of black people with a high school degree? What about those with a college degree?

Solution hint: There is evidence of discrimination of black high school graduates: These seem to earn 6.3% less than their white counterparts. Because we condition on ability, and assuming AFQT is a perfect measure, this cannot be driven by differences in ability in the two groups. Also, the discrimination doesn't seem to go away with experience, as the coefficient on black interacted with experience is small and insignificant. In contrast, there is evidence of positive discrimination of black college graduates: They earn around 11% more than their white counterparts conditional on ability. This could be driven by for example affirmative action policies. This difference, however, goes away after 8-9 years, as the coefficient on black interacted with experience is negative, significant and larger than the initial pay gap.

(b) What type of discrimination is consistent with the results in column (1)?

Solution hint: Statistical discrimination is a form of discrimination where one group is paid lower wages because employers set wages based on the group average productivity/ability when individual ability is not observed. If this was the case, we should see the discrimination diminish as employers learn more about their employees true ability. This is not the case, as evident by the interaction between black and experience: Even though employers seem to be learning about their employees true ability over time, this does not diminish the black/white pay gap. Therefore, these results point more to some form of taste-based discrimination. [For this question, students should be given some of the points for just correctly identifying the two forms of discrimination, even if they cannot argue for which of them is present. A claim that one of them is present without an explanation for why or an explanation of the two forms should give no points.]

(c) Is there support for people signaling ability through a high school diploma? What about a college degree?

Solution hint: There is no evidence for a high school diploma working as a signaling device. If this was the case, we would see that ability had an initial impact on wages among high school students, because high school students would be able to prove their ability by using their high school diploma. Rather, employers seem to be learn- ing about their employees over time, as evident by the interaction of ability and experience. In contrast, there is evidence of a college diploma being used as a signaling de- vice: For college graduates, ability pays off right away, while there does not seem to be employer learning going on. This is consistent with the idea that a college diploma allows you to signal, or credibly show, that you have high ability, thus giving you a wage increase right away.