UNIVERSITY OF WARWICK

Summer Examinations 2015/2016

Topics in Applied Economics

Time Allowed: 2 Hours plus 15 minutes reading time during which notes may be made (on the question paper) BUT NO ANSWERS MAY BE BEGUN.

Answer TWO questions in Section A (15 marks each) and TWO questions in Section B (35 marks each). Answer Section A questions in one booklet and Section B questions in a separate booklet.

Read carefully the instructions on the answer book provided and make sure that the particulars required are entered on each answer book. If you answer more questions than are required and do not indicate which answers should be ignored, we will mark the requisite number of answers in the order in which they appear in the answer book(s): answers beyond that number will not be considered.

Section A: Answer TWO questions

For each sub-question, provide an answer. Answers should be precise and concise (while remaining grammatically correct). The answer to each sub-question is limited to 150 words.

1. Answer all the following subquestions.

   (a) Explain what the Hodrick-Prescott (HP) filter is and the tradeoff that is governed by the parameter λ. **(5 marks)**

   (b) Explain what Solow residuals are and how they can be recovered in the data. **(5 marks)**

   (c) What is the main driving force behind the Real Business Cycle (RBC) model? Explain how it can generate movements in the RBC model. **(5 marks)**

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2. Answer all the following subquestions.

   (a) Explain what a counterfactual is. **(5 marks)**

   (b) Explain what the Single Unit Treatment Value Assumption is. **(5 marks)**

(c) Explain what imperfect compliance is and what problems it creates when one runs a randomized controlled trial. **(5 marks)**

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3. Explain briefly what the instrumental variables approach is. Under what conditions will it yield consistent estimates for the causal effect of the instrumented variable on the outcome of interest? **(15 marks)**

Section B: Answer TWO questions

4. Consider the Real Business Cycle (RBC) model in which the representative household maximises the lifetime utility over consumption and leisure, given by

$$\max_{\{c_t, h_t\}_{t=0}^{\infty}} \sum_{t=0}^{\infty} \beta^t \left[\frac{c_t^{1-\sigma} - 1}{1 - \sigma} + \psi \frac{(1 - h_t)^{1-\eta} - 1}{1 - \eta} \right]$$

where c_t is consumption at time t and h_t is hours worked at time t. The budget constraint of the household is given by $K_{t+1} = (1 + r_t - \delta)K_t + w_t h_t - c_t$. Greek letters are the usual parameters.

The firm produces output using Cobb-Douglas production function given by:

$$Y_t = A_t K_t^{\alpha} N_t^{1-\alpha},$$

taking as given wage, w_t, and rental rate of capital, r_t. Assume that the initial capital stock, K_0, is given and that exogenous technology process follows an $AR(1)$ process given by $A_t = \rho_a A_{t-1} + \varepsilon_t$ with $\rho_a \in (0, 1)$ and $\varepsilon_t \sim N(0, \sigma_\varepsilon^2)$.

(a) Write down the equilibrium conditions of this model. Carefully explain the intuition behind them. **(10 marks)**

(b) What does it mean to calibrate the model? Explain how would you go about calibrating parameters β, σ, η and δ. **(7 marks)**

(c) Explain the difference between state and choice variables. List the state and choice variables of this model. **(6 marks)**

(d) Explain which empirical business-cycle facts this model can match reasonably well and why. **(6 marks)**

(e) Explain the main criticism of the RBC model? **(6 marks)**

5. Consider the paper by Banerjee, Cole, Duflo and Linden published in the Quarterly Journal of Economics in 2007.

   (a) What is the policy problem motivating the intervention? **(5 marks)**

   (b) What are the interventions tested in this paper? When and where did the evaluation of these evaluations take place? **(5 marks)**

   (c) Describe the experimental design. What were the potential flaws resulting from the implementation? **(5 marks)**

   (d) What are the main outcomes and how are they measured? How are the effects estimated and what are the main results? **(5 marks)**

   (e) What is the theory of change? **(5 marks)**

   (f) Would there have been a better design than the one used by the authors to identify indirect effects? **(5 marks)**

   (g) What are the paper's policy conclusions? What are the contributions to the academic literature? **(5 marks)**

6. Explain what a regression discontinuity (RD) design is. **(35 marks)**

   In your answer discuss the following terms:

   (a) Cutoff score

   (b) Thresholds

   (c) Running variable

   (d) Manipulation of the running variable/assignment variable

   (e) Balancing tests around the threshold of baseline characteristics

(End)