

## Econ 496: Economic Growth and Development

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**Instructions.** Please limit your answer to the space provided below each question. Do not write on the back of this exam paper (it will not be marked). Please print your answer, or write neatly (I cannot grade answers that I cannot read). Note: If the question asks you to answer in words only, then it really does mean words only (marks will be subtracted for using symbols, equations or diagrams).

1. [20 Marks]. According to the Solow model, cross country differences in long-run living standards can differ for a variety of reasons. Using words only (no math or diagrams), explain at least three of these reasons, making sure to provide the economic intuition behind each reason.

2. [10 Marks]. Explain the limits of the Solow model as a theory that is capable of giving underdeveloped countries useful policy advice.

3. [10 Marks]. According to Parente and Prescott, cross country TFP differences account for most of the cross country differences in living standards. In words only (no math or diagrams), explain how and why special interests may conspire to block the adoption of superior technologies.

4. [20 Marks]. Consider an economy that consists of a representative household with preferences for  $\{c_t, l_t\}_{t=0}^{\infty}$  given by:  $\sum_{t=0}^{\infty} \beta^t [\ln(c_t) + \lambda \ln(l_t)]$ , where  $0 < \beta < 1$  and  $\lambda > 0$  are preference parameters.<sup>1</sup> The production of output is determined by  $y_t = z_t$ , where  $z_t$  denotes the stock of ‘knowledge capital.’ All output is consumed; i.e.,  $c_t = y_t$ . Assume that  $z_0 > 0$  is given. However, knowledge can be accumulated according to:  $z_{t+1} = (1 + e_t)z_t$ , where  $e_t$  denotes the fraction of available time devoted toward ‘learning activities.’ Assume that the household has one unit of time per period and that this time may be divided between learning and leisure; i.e.,  $e_t + l_t = 1$ , with  $1 \geq e_t \geq 0$ .

(a) Solve for the steady state growth rate  $e^*$  as a function of  $\lambda$  and  $\beta$ .

(b) How does  $e^*$  depend on  $\lambda$  and  $\beta$ ? Provide economic intuition.

(c) What happens to  $e^*$  if  $\lambda > \beta$ ? Explain.

(d) Solve for the *level* of output at date  $t$  as a function of  $e^*$  and  $z_0$ .

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<sup>1</sup>  $MRS(l_t, c_{t+1}) = (\lambda c_{t+1})/(\beta l_t)$ .