

Student name: _____

Student ID number: _____

**ECON 133 “Global Inequality and Growth”
Midterm**

Instruction: Please write with a pen, not a pencil. Write your answers in the boxes: nothing outside of the boxes will be graded.

1. True False Statement/Questions (10 points)

Explain your answer fully based on what has been discussed in lecture and in section. No more than 5 lines per question. All the credit is based on the explanation.

- (a) Global income inequality should always be measured using PPP exchange rates rather than market exchange rates.

- (b) Global inequality would be lower than today if average income was the same across countries.

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- (c) The equation $\alpha = r \times \beta$ is true whatever the elasticity of substitution between capital and labor.

A large, empty rectangular box with a thin black border, intended for the student's answer to question (c).

- (d) If income is Pareto-distributed with a Pareto coefficient a equal to 3, the average income above \$1 million is \$3 million.

A large, empty rectangular box with a thin black border, intended for the student's answer to question (d).

- (e) A country that receives positive net foreign income necessarily has a positive net foreign asset position.

A large, empty rectangular box with a thin black border, intended for the student's answer to question (e).

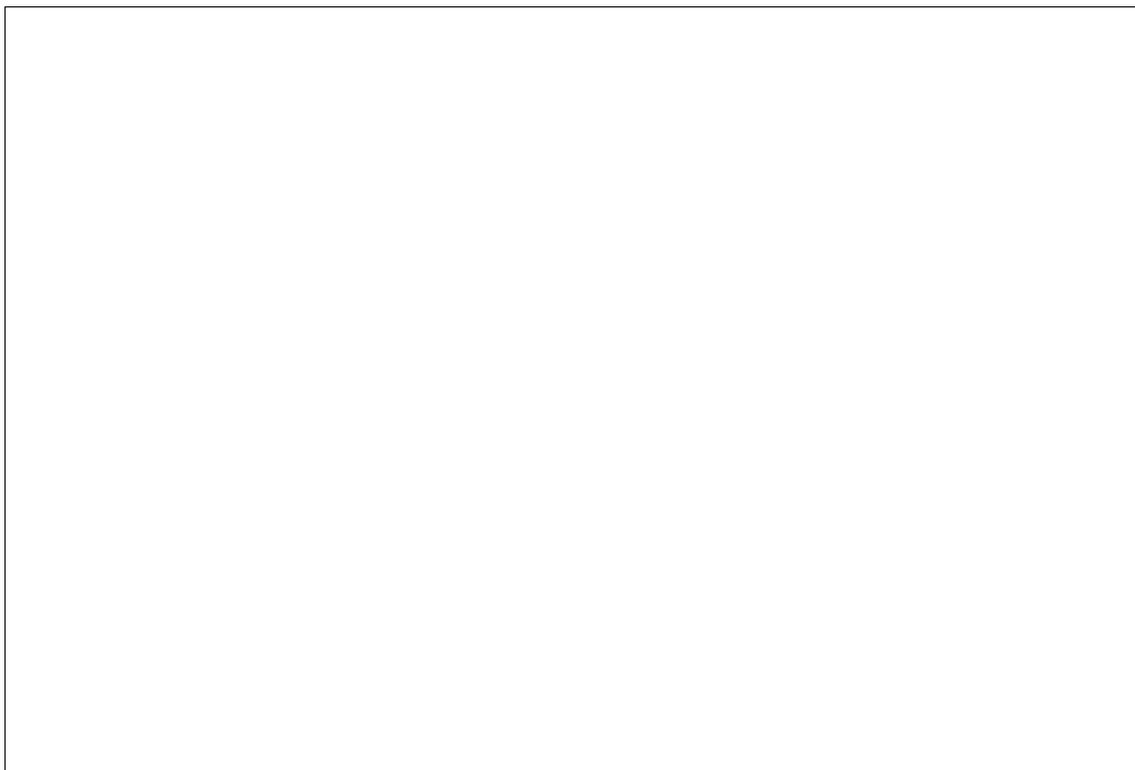
2. **Exercise 1 (10 points)**

Consider the following wealth accumulation equation: $W_{t+1} = W_t + s_t Y_t$, where W_t is wealth in year t , s_t is the saving rate, and Y_t is national income. Assume that the growth rate of national income is g_t for period t .

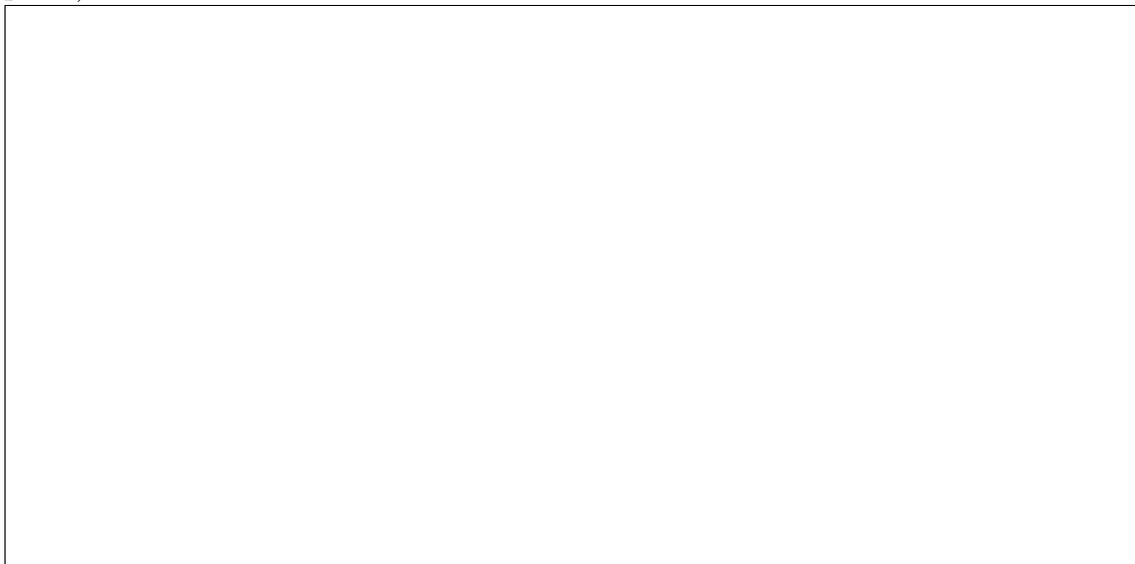
- (a) What assumption does this equation make about the sources of wealth accumulation? (1 point)

- (b) Express β_{t+1} , the wealth-income ratio for period $t + 1$, as a function of β_t , s_t and g_t . (2 points)

(c) Show that in steady state, $\beta = \frac{s}{g}$. (2 points)



(d) How useful is this relationship in understanding China's current saving rate? (1 point)



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- (e) Assume that in steady state, $s = 12\%$, $g = 1.5\%$, and the average rate of return to capital is $r = 4\%$. What are the implied values for β and α in steady state? Explain. (2 points)

- (f) How has the wealth-income ratio β evolved in rich countries since 1970? In countries like France and the U.K., how do today's wealth-income ratios compare to the wealth-income ratios of the 18th-19th centuries? (2 points)

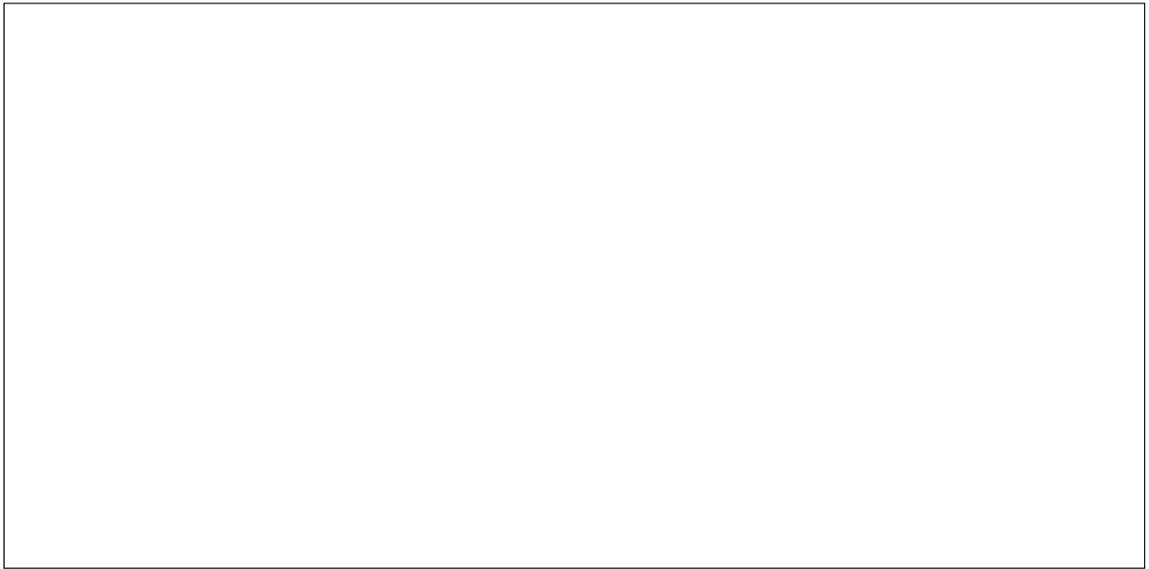
3. Exercise 2 (10 points)

Consider a CES production function $Y = F(L_s, L_u) = (A_s(L_s)^\rho + A_u(L_u)^\rho)^{\frac{1}{\rho}}$ with L_s high-skill labor, and L_u low-skill labor, A_u and A_s are two separate technology terms and ρ is a constant $\in (-\infty, 1)$.

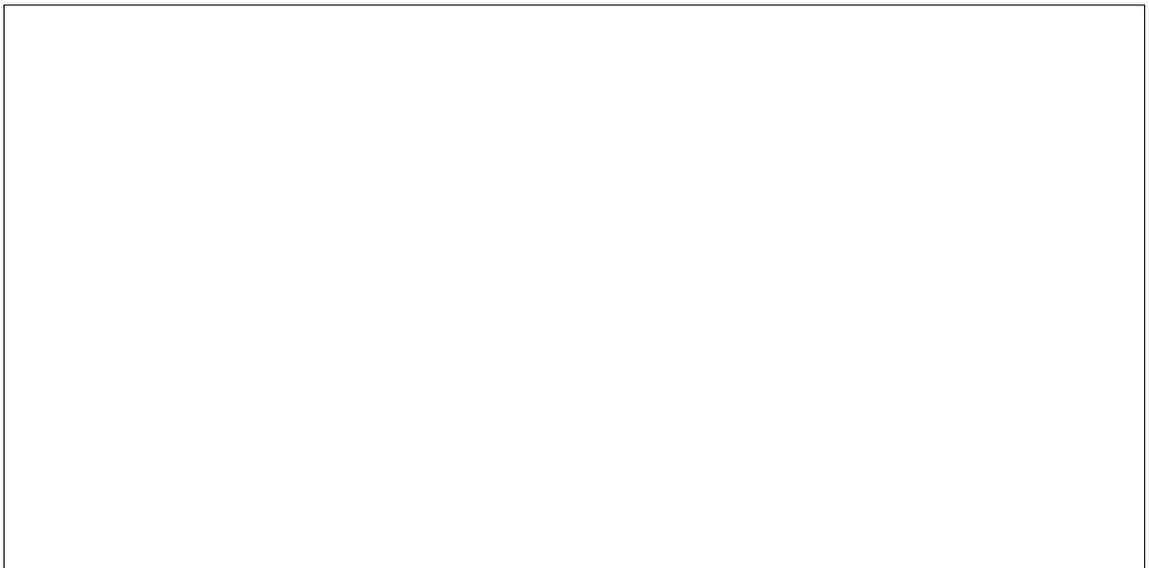
- (a) Give the definition of the skill premium (1 point).

- (b) Show that in this model, the skill premium is equal to $\frac{A_s}{A_u} \left(\frac{L_u}{L_s}\right)^{1-\rho}$. (2 points)

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- (c) What does $\frac{A_s}{A_u}$ capture? How has this ratio evolved in the U.S. since the 1960s? (2 points)



- (d) What does $\frac{L_s}{L_u}$ capture? How has it evolved in the U.S. since the 1960s? (2 points)



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- (e) In fact, $\rho = \frac{\sigma-1}{\sigma}$ where σ is the elasticity of substitution between skilled and unskilled labor. Discuss how changes in $\frac{L_u}{L_s}$ affect the skill premium depending on σ . (2 points)

- (f) Some politicians have advocated in favor of making it harder for big corporations to merge. How would such policy affect the skill premium? (2 points)

Bonus (2 points): We tweeted a The Guardian article about the gender gap. What policy does the article discuss? Name an approach that has proven to be effective within the firms that improved their gender gap.