Name: _____ **Student ID:** _____

ECON 0150 | MiniExam 08 | Spring 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

____ I will complete this MiniExam solely using my own work.
____ I will not use any digital resources unless explicitly allowed by the instructor.
____ I will not communicate directly or indirectly with others during the MiniExam.

Q1. In a regression model examining agricultural productivity with seasonal controls:

$$\log(\text{Yield}) = \beta_0 + \beta_1 \cdot \text{Trend} + \beta_2 \cdot \text{Summer} + \beta_3 \cdot \text{Fall} + \beta_4 \cdot \text{Winter} + \varepsilon$$

What does the coefficient β_1 represent?

A) The percentage change in yield during each season
B) The average yield in the Spring season (the omitted category)
C) The underlying trend in yields after controlling for seasonal effects
D) The total annual productivity growth

Q2. Which model specification would be most appropriate for examining whether urban and rural areas respond differently to infrastructure investments?

A) $\log(\text{Growth}) = \beta_0 + \beta_1 \cdot \text{InfraInvest} + \beta_2 \cdot \text{Rural} + \beta_3 \cdot \text{Population} + \varepsilon$
B) $\text{Growth} = \beta_0 + \beta_1 \cdot \text{InfraInvest} + \beta_3 \cdot (\text{InfraInvest} \times \text{Rural}) + \varepsilon$
C) $\text{Growth} = \beta_0 + \beta_1 \cdot \text{InfraInvest} + \beta_2 \cdot \log(\text{Rural}) + \varepsilon$
D) $\log(\text{Growth}) = \beta_0 + \beta_1 \cdot \text{InfraInvest} + \beta_2 \cdot \text{Rural} + \varepsilon$

Q3. An epidemiologist studying infection rates in several countries includes country fixed effects in their model. What does this control for?

A) Time-varying factors that affect all countries equally
B) Country-specific factors that remain constant over time
C) Specific disease characteristics that vary by country
D) Global pandemic waves that occur simultaneously

Q4. Which transformation is typically used to address autocorrelation in time series data and focus on period-to-period changes?

A) Seasonal adjustment using dummy variables
B) A logarithmic transformation of the outcome variable
C) First-differencing instead of levels
D) Growth rates instead of levels

Q5. The following model examines how industry experience affects earnings potential with a gender interaction:

$$\log(\text{Earnings}) = \beta_0 + \beta_1 \cdot \text{Experience} + \beta_2 \cdot \text{Female} + \beta_3 \cdot (\text{Experience} \times \text{Female}) + \varepsilon$$

a) If $\beta_1 = 0.06$, $\beta_2 = -0.18$, and $\beta_3 = -0.02$, calculate and interpret the percentage return to an additional year of experience for women.

b) What economic phenomenon might explain the pattern observed in the interaction coefficient (β_3)?

c) How would you modify this model to also account for time-invariant industry-specific factors?

Q6. Consider the following regression output analyzing how changes in interest rates affect changes in housing prices with Δ Housing Price Index (percentage points) as the outcome variable:

	Coefficient	Std. Error	t-value	p-value
Intercept	1.85	0.42	4.40	<0.001
Δ Interest Rate (%)	−4.23	0.95	−4.45	<0.001

a) Interpret the intercept (β_0) in this model.

b) Does the coefficient for Δ Interest Rate match economic theory?

c) What alternative specification might you recommend if you suspect the relationship is non-linear?