

Economics 102 — Winter 2025

Globalization

Midterm 2 Exam **Blue** Version

February 18, 2025

Time: 50 minutes

Total score: 50 points

Last Name, First Name: _____

Seat Number: _____

Student ID: _____

Permissible objects during the exam: pencils, pens, one ruler, one eraser, student ID.

All other objects, including any other electronic devices, calculators, and any smart watches, must be outside your immediate reach at all times.

A violation of these exam rules will result in a zero score on the exam.

Carefully read the instructions of each question.

Words in **bold** indicate that you need to respond to the request or question.

If you answer with “yes” or “no”, also provide an explanation.

If you become aware of a potential academic integrity violation, campus offices and the economics department encourage you to alert the instructor or to make an anonymous report to the Academic Integrity Office at *academicintegrity.ucsd.edu*.

Pledge of Academic Integrity

Read the statement below, then write “I pledge to excel with integrity” word by word on the line below, sign, and date.

I pledge to complete this exam honestly and fairly so that the exam submitted represents my own knowledge and abilities. I also pledge to not facilitate the dishonesty of others by, for example, sharing with others this exam or the contents herein.

“I pledge to excel with integrity”

Signature

Date

1 Ricardian Trade with Multiple Goods: 10 minutes

Suppose there are two countries—Home (no asterisk) and Foreign (asterisk)—and four sectors: agriculture (A), mining (B), manufacturing (M), and services (S). All industries' products are tradable and markets are perfectly competitive. Productivities in the four sectors and the two countries are given by the following *constant* unit labor requirements:

| | Home | Foreign* | a_i^*/a_i |
|-------------------|------------|--------------|-------------|
| Agriculture (A) | $a_A = 30$ | $a_A^* = 10$ | |
| Mining (B) | $a_B = 10$ | $a_B^* = 20$ | |
| Manufacturing (M) | $a_M = 20$ | $a_M^* = 5$ | |
| Services (S) | $a_S = 10$ | $a_S^* = 10$ | |

Hint: You may find it useful to compute the unit labor requirement ratios a_i^*/a_i for sectors $i = A, B, M, S$.

Suppose Home's per-capita income is one-half of Foreign's per-capita income under free trade: $w/w^* = 1/2$.

- 1.1. **State** the sector in which Home has the strongest *comparative* advantage.
- 1.2. **State** the sector in which Foreign has the strongest *comparative* advantage.
- 1.3. In equilibrium with free trade and complete specialization, **which** sectors locate at Home? **Which** sectors abroad?

Suppose Home's labor productivity doubles (its unit labor requirements fall by half), while the relative wage increases to $w/w^* = 2/3$.

- 1.4. In equilibrium with free trade and complete specialization, **which** sectors might locate in both countries now? **Which** sectors locate only at Home? **Which** sectors locate only abroad?

2 Tariff on Aluminum: 10 minutes

Consider the United States a *large* country and an importer of aluminum. The diagram below depicts the aluminum industry's *domestic* market conditions. The average world price of aluminum is P^W , and there is free trade initially. (The market equilibrium labelled with A shows the hypothetical autarky case.)

2.1. **Show** the aluminum import volume under free trade.

The U.S. government imposes an import tariff on aluminum products.

2.2. **Depict** the *domestic price* P after the tariff is imposed.

2.3. **Depict** the *world price* P^* after the tariff is imposed.

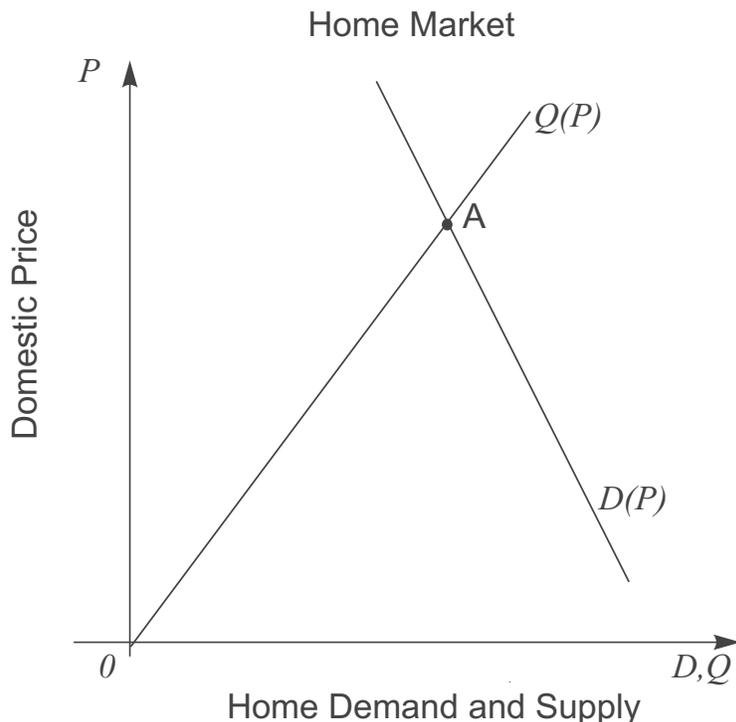
On February 13, 2025 the *Financial Times* reported: “Mills are taking full advantage of the ... current situation.”

2.4. **Show** the additional producer surplus (profit) from the aluminum tariff on aluminum products.

The *Financial Times* report continued: “Executives at LCI Industries, an Indiana supplier that makes chassis and other parts for recreational vehicles, ... said ... tariffs ... were ‘an overhang’ that could dent its profit margin.”

2.5. Consider LCI Industries an aluminum consumer on the demand side. **Show** the effect of an increase in tariffs on consumer surplus.

2.6. **Show** the tariff revenue collected by the federal U.S. government. **Can** there be a net surplus gain for the U.S. economy as a whole?



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3 Trade and Innovation Incentives: 10 minutes

A firm owner is the Principal and the manager the Agent. Consider the table of payoffs below, where X is unknown.

| | Principal P | | | Agent A |
|---------------|------------------------------|-----------------------------|---------------------|----------------|
| | High ($1/2$) Mkt. share | Low ($1/2$) Mkt. share | Expected Revenue | Effort Cost |
| Innovation | X | 40 | $X/2+20$ | -10 |
| No innovation | 40 | 16 | 28 | 0 |
| Participation | Profits ≥ 0 | | | Pay ≥ 0 |

Suppose the Principal offers the Agent a fixed wage of 10.

- 3.1. **What** is the Agent's payoff in the *Innovation* case and **what** is it in the *No innovation* case?
- 3.2. **Will** the Agent choose to innovate?
- 3.3. **What** is the Principal's payoff (revenue less wage payment of 10) under the Agent's choice?

Suppose instead the Principal offers the Agent a pure bonus pay contract with

$$w = 0.5 \cdot \text{Expected Revenue.}$$

Under this bonus pay the Agent earns one-half of revenue, while the Principal keeps the remaining half of revenue.

- 3.4. **How** large does X need to be so that the Agent chooses to innovate?
- 3.5. For this threshold value of X , **is** the Principal better or worse off in equilibrium compared to offering a fixed wage of 5? **Why**?
- 3.6. **Does** protectionism make it more or less likely that a domestic firm's global market share will attain X ? **Why**?

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4 Trade Negotiations: 10 minutes

In a paragraph or two, **explain** to a freshman college student in words **why** individual countries have a dominant incentive to impose trade restrictions, regardless of their trade partner's trade policy. Refer to the effect of trade restrictions on the Terms of Trade. Further **explain** why this strategic constellation is a rationale for trade agreements.

Note: In your arguments, you may but need not allude to the Prisoner's Dilemma, and you may suppose that the freshman college student is familiar with the Prisoner's Dilemma.

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5 True or False: 10 minutes

Evaluate each of the following statements as true or false. For each statement, **also provide** a brief reason (in one or two sentences).

5.1. In classic trade theory, both export subsidies and learning by exporting worsen a country's terms of trade.

5.2. In classic trade theory, both export taxes and import taxes improve a country's terms of trade.

5.3. Global competition improves the incentives for innovation.

5.4. There are two political parties that commit to an election platform. Voters turn out with fixed probability and have diverse preferences solely about the level of globalization. Then, if extreme views become more extreme, no party changes platform.