Final Exam **Gold** Version

March 18, 2025

Time:	100 minutes
Total score:	100 points

Last Name, First Name: _____

Student ID: _____

Seat Number: _____

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 and Tariff: 10 minutes

There are two countries and three sectors: primary products (P), manufactures (M) and services (S). Wages differ by a factor of $w/w^* = 1.5$ between the two countries. Productivities in the three sectors in Home (no asterisk) and Foreign (asterisk) are given by the following unit labor requirements:

	Home	Foreign	$A_i \equiv a_i^*/a_i$	$(1+\tau)A_i$
Primary	$a_P = 4$	$a_P^* = 2$		
Manufactures	$a_M = 2$	$a_M^* = 6$		
Services	$a_S = 4$	$a_S^* = 6$		

1.1. **State** the order of the three sectors from strongest to weakest comparative advantage for the *Home* economy.

1.2. **Which** sectors locate abroad? **Which** sectors locate at home?

Suppose the Home country imposes a tariff of $\tau = 0.5 = 50\%$ on all imports (P, M and S), and that the Foreign country does not retaliate. The wage ratio rises to $w/w^* = 2$. When consumers in the Home country now decide between procuring a good or service locally or from abroad, their decision for local purchase depends on the condition $wa_i \leq w^* a_i^* (1 + \tau)$.

1.3. **How** does $(1 + \tau)A_i$ have to relate to w/w^* for a good or service to be bought from Home by Home consumers?

1.4. **Which** goods or services will home consumers buy locally (from Home)? **Which** goods or services will be imported from the Foreign country?

When consumers in the Foreign country decide between procuring a good or service locally or from abroad (Home), their decision for local purchase depends on the condition $wa_i > w^* a_i^*$ because they are not subject to a tariff. The wage ratio is $w/w^* = 2$.

1.5. **How** does A_i have to relate to w/w^* for a good or service to be bought from Foreign by Foreign consumers?

1.6. **Which** goods or services will Foreign consumers buy locally (from Foreign)? **Which** goods or services will be imported from the Home country?

1.7. One good or service now becomes non-traded: consumers in both countries buy it locally but neither country's consumers import it. **Which** good or service becomes non-traded under the tariff?

2   Classic Trade and Inequality: 10 minutes

Suppose the Home country is relatively abundantly endowed with *low-skilled labor*, compared to its trade partners. There *is* free trade already. The graph below depicts the labor market for low and high-skilled workers in the Home country and their allocation to agriculture (lower left origin) and manufacturing (upper right origin).

2.1. **Is** agriculture relatively intensive in low-skill or high-skilled labor?

2.2. **Which** sector is the Home country's export sector?

2.3. Suppose the Home country experiences an improvement in its terms of trade. **Which** sector will expand?

2.4. **Depict** a possible labor market equilibrium after the improvement in the terms of trade. **How** does the relative wage w_H/w_L change as the export sector expands and exerts additional labor demand?
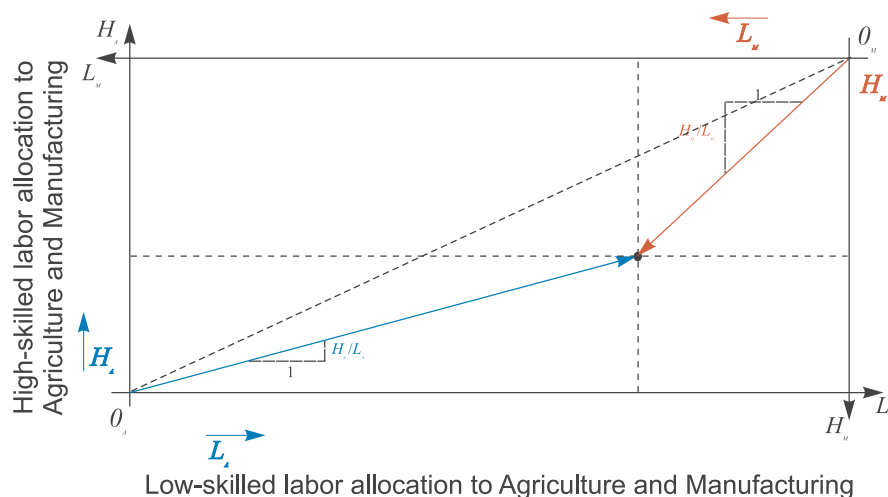
3   Classic Trade and Outward Migration: 10 minutes

Suppose the Home country is relatively abundantly endowed with *high-skilled labor*. Computer production is relatively high-skill intensive, while food production is low-skill intensive. There *is* free trade already.

3.1. **Depict** an equilibrium in the Edgeworth box, consistent with the production intensities. *Note*: The arrow for the computer industry is steeper than the diagonal of the box.

3.2. According to the Stolper-Samuelson Theorem, **how** (if at all) does the relative factor price w_H/w_L change when the relative computer price P_C/P_F *increases*?

3.3. **How** (if at all) does the relative factor price w_H/w_L change when free trade keeps P_C/P_F constant?

Now suppose there is large-scale outward migration of low-skilled labor from the Home country but free trade in final goods keeps P_C/P_F constant.

3.4. **How** (if at all) do the slopes of the production arrows change?

3.5. **Depict** outward migration of low-skilled labor by shrinking the Edgeworth box *from the right* (moving O_F left).

3.6. **Depict** the new equilibrium in the Edgeworth box.

3.7. **How** do computer and food production change?
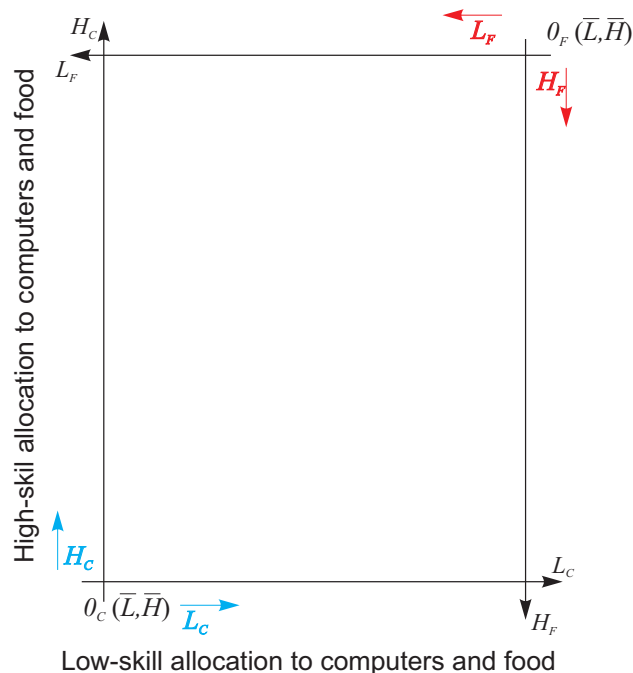
4 Offshoring and Inequality: 10 minutes

There are two regions—North (onshore) and South (offshore)—and two factors of production: High-skilled labor H and low-skilled labor L. The Southern economy is relatively abundant in low-skilled labor L. There are multiple stages of production, each with a different and fixed intensity of employing high-skilled labor H relative to low-skilled labor L. There is trade in intermediate goods from these production stages. Some production stages locate in the North, others in the South. The graph below depicts the skill intensity of production stages located in the South (offshore) and the North (onshore).

4.1. **Which** economy hosts relatively more skill intensive production stages?

Suppose a trade conflict results in higher tariffs and raises offshoring costs.

4.2. **How** does the location of production stages change in the South and the North?

4.3. **Depict** a possible labor market equilibrium after the change in offshoring costs.

4.4. **How** does the relative wage w_H/w_L change in Mexico as new production stages located in Mexico and exert additional labor demand?

4.5. **How** does the relative wage w_H/w_L change in the United States?
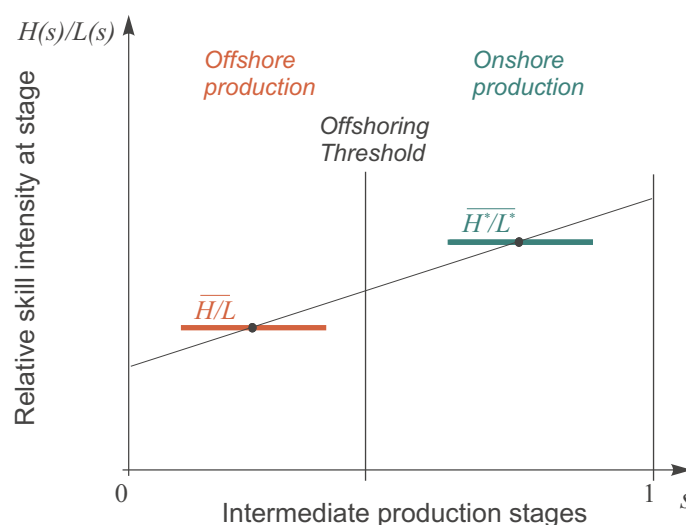
5   Intertemporal Trade: 10 minutes

The Home country is open to international capital markets. The Home country's resources today and tomorrow are depicted in the diagram below.

5.1. In the diagram, **depict** the total amount of savings today S_{today}, and **depict** the current account balance today CA_{today}.

5.2. **Is** the country borrowing or lending resources today? **Why**?

5.3. In the diagram, **draw** the intertemporal production possibility frontier (PPF) that transforms investment today I_{today} into output tomorrow $Y_{\text{tomorrow}}^{\text{GDP}}$.

5.4. **Depict** the economy's production decision W_{product} on the PPF.

5.5. **Draw** the international credit line (the intertemporal terms of trade line) with a slope of $-(1+r^*)$.

5.6. **Depict** the economy's consumption decision W_{consume} on the international credit line.

5.7. **Will** GDP tomorrow exceed or fall short of national income (GNI) tomorrow? **What** is their difference?
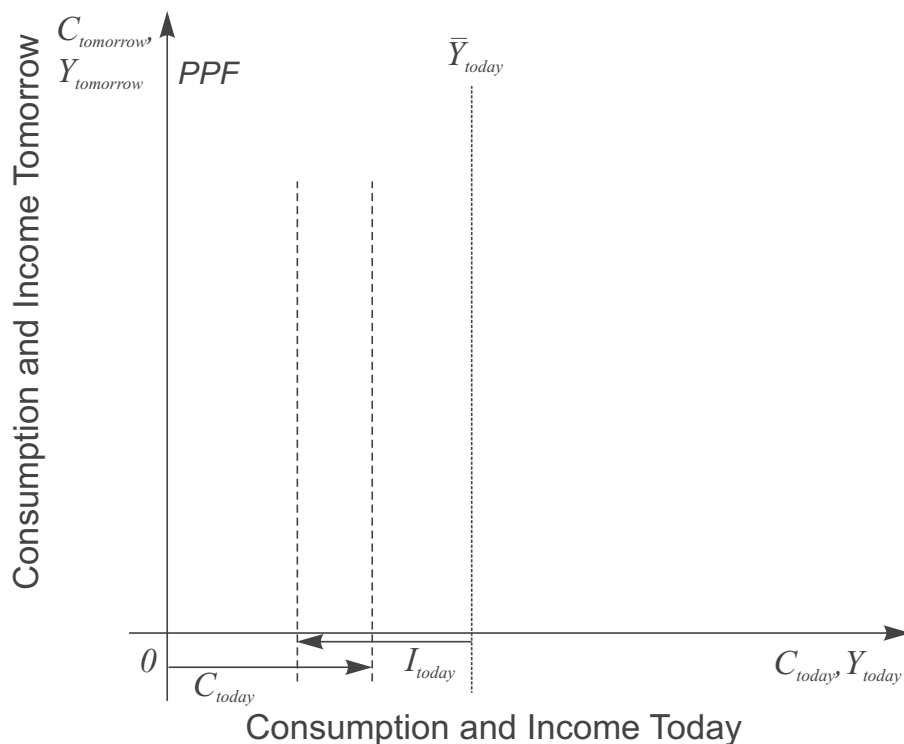
6   Provoked Default: 10 minutes

Consider Mexico (MEX), a borrower from foreign lenders today. There is sovereign default risk, and Mexico may not repay the principal or interest on the debt.

6.1. **Depict** Mexico's optimal current account balance today for the optimal choices of investment and consumption shown at the points W.

6.2. **Depict** the minimal level of investment that Mexico needs to adopt today in order to repay its debt tomorrow.

6.3. **Depict** the level of investment that Mexico could adopt today in order to produce only enough for subsistence (autarky) consumption tomorrow.

Suppose Mexico contracts the optimal amount of debt under fair capital markets but invests only enough for subsistence consumption tomorrow to provoke its inability to repay the debt.

6.4. **What** is the amount of extra consumption today that Mexico can secure under provoked default?
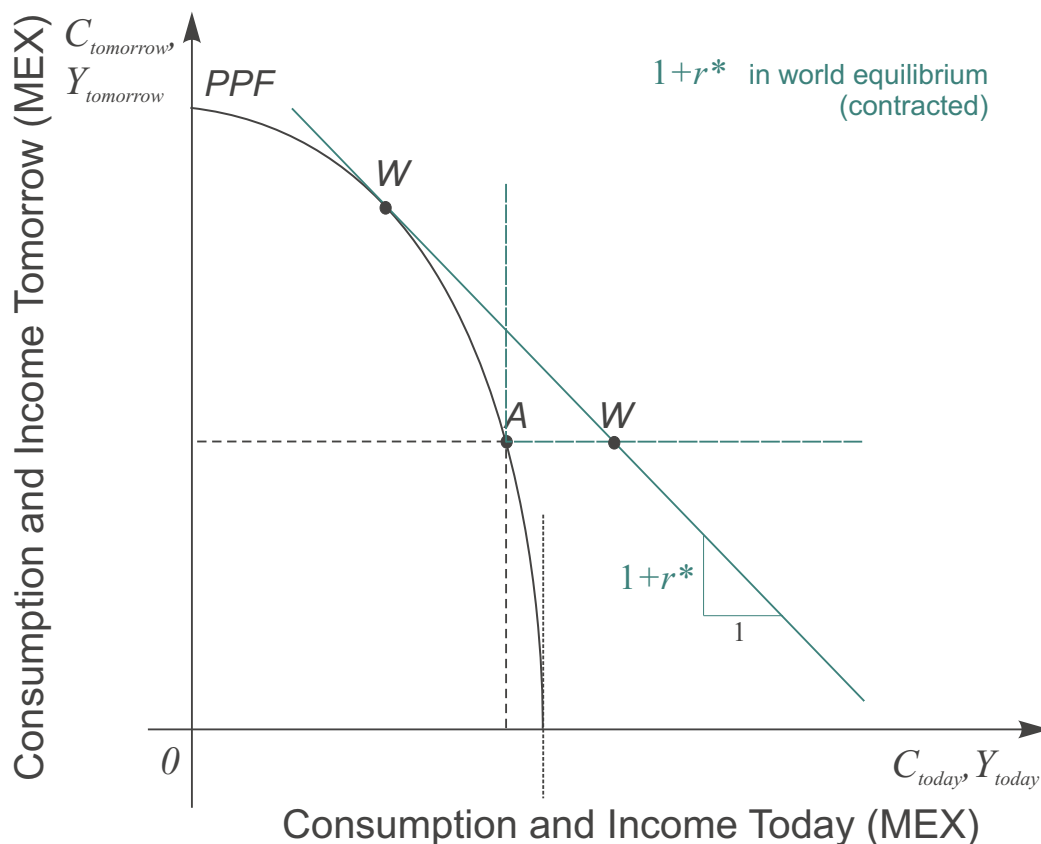
7   Debt Overhang: 10 minutes

The face value of debt D is the nominal amount of underwritten liabilities. The market value V of debt is its face value times the probability of repayment

$$V(D, I) = (1 - p_{\text{default}})D.$$

Consider the Debt Laffer Curve as depicted below.

7.1. **Is** there a difference between a country's debt market value V and the country's expected debt repayment? **Why** or why not?

7.2. Consider a point on the Debt Laffer Curve that is just to the West of its point of inflection, where the country is in debt overhang. **Depict** the point.

7.3. If the country starts buying back its debt at the marked point, **what** is the market price it pays per dollar of debt D? **Depict** the market price in the diagram.

7.4. Pick a level of debt buyback (ΔD) and **depict** the change in the face value of the debt buyback in the diagram. For your chosen amount of buyback (ΔD), **depict** by how much the market value declines (ΔV).

7.5. **Does** a debt buyback offer a good return to the borrower country?

7.6. If you are a lender to the country, **would** you sell your loan during the buyback or hold on to your loan?
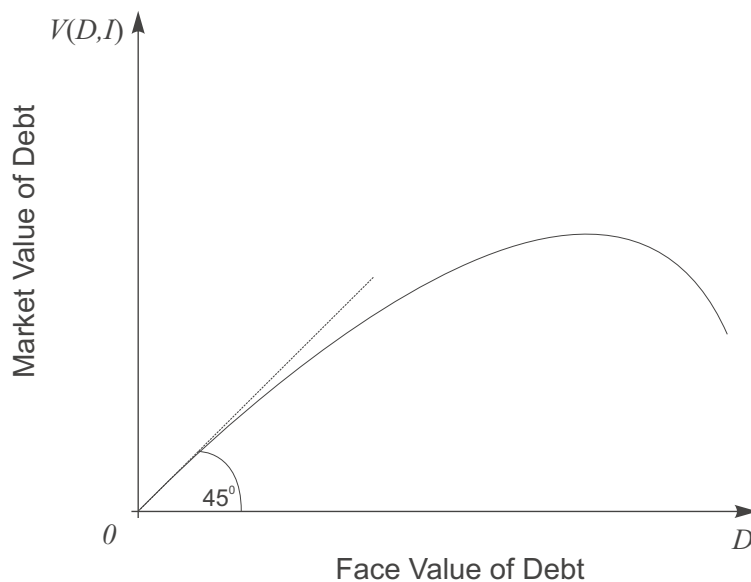
8   Current Account Sustainability: 10 minutes

8.1. **State** the current account balance CA as a function of the trade balance TB and international interest payments r^*W on a country's net foreign wealth W.

8.2. In a long-run steady state, an economy neither raises nor reduces its net foreign wealth W. **What** does the long-run steady state imply for the economy's current account balance CA?

8.3. **What** does the long-run steady state imply for the economy's trade balance TB in relation to international interest payments r^*W, given the long-run current account balance CA?

8.4. Considering the steady-state relationship for the trade balance TB above, for **which** country below does the foreign debt level $W < 0$ appear to be most sustainable, and for **which** country least sustainable?

| Country	Foreign debt ($W < 0$)	Imports/year	Exports/year
X	400 million	800 million	1 billion
Y	200 million	400 million	300 million
Z	1 billion	6 billion	7 billion

9   Degrees of Capital Market Globalization: 10 minutes

Explain to a freshman college student **what** the empirical relationship depicted in the figure below shows. Also **explain what** economic theory would predict for the depicted relationship to be if international capital markets were fully integrated and if countries were completely closed. **Reference** explicitly the definitions of savings, investment, GDP and international capital flows.
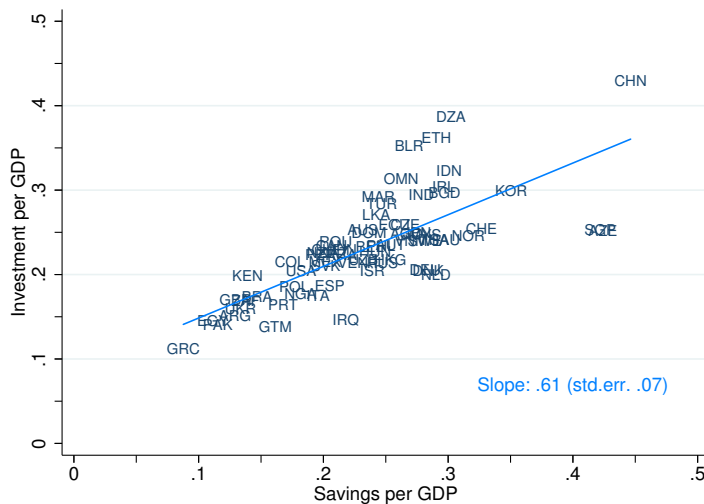
10 True or False: 10 minutes

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

10.1. Consider a country with a trade imbalance (a non-zero trade balance) but no other income transfers. A net importer with a negative trade balance fails to attract foreign capital flows.

10.2. Suppose there are two unequal countries, producing certain output with local technologies and installed capital, and there are infinitely many time periods. Then a debtor country's trade balance is positive in steady state.

10.3. Suppose there are two unequal countries, producing uncertain output with local technologies and pre-existing debt. Actors can take hidden action. Then debt forgiveness reduces the borrower's investment level.

10.4. Suppose there are two unequal countries, producing uncertain output with local technologies and installed capital. Actors can take hidden actions. Then lenders lose money on their foreign investments in expectation.