Suggested Solutions

Exam 2: Version B
Spring 2016

Do not open this exam until instructed to do so.

- You have 75 minutes to complete this exam
- You may use a calculator; you may **not** use any other device (cell phone, etc.)
- You may consult one page of notes (both sides); you may not use books, notebooks, etc.
- Show your work

I understand that the honor code applies: I will not lie, cheat, or steal to gain an academic advantage, nor tolerate those who do.

Signature

Michael Waugh

Printed Name

For each question below, **write the letter of the most correct answer to the left of the question.**

1. (3 pts.) If one country's wage level is very high relative to the other's
   - A. only the high wage country has a comparative advantage.
   - B. only the low wage country has a comparative advantage.
   - C. neither country has a comparative advantage.
   - D. it is possible that both will enjoy gains from trade by specializing according to their comparative

2. (3 pts.) Under the model of monopolistic competition, a __________ in the number of firms in the industry will cause __________ to __________ .
   - A. increase; price; increase
   - B. increase; average cost; decrease.
   - C. decrease; markup; decrease.
   - D. increase; price; decrease.

3. (3 pts.) If the U.S. has a comparative advantage in goods that employ high-skill labor, and Mexico has a comparative advantage in goods that employ low-skill labor. Trade between the US and Mexico
   - A. is likely to hurt high-skilled workers in the U.S.
   - B. is likely to hurt low-skilled workers in the U.S.
   - C. is likely to hurt low-skilled workers in Mexico.
   - D. must help low skill workers on both sides of the border.

4. (3 pts.) Under the model of monopolistic competition and if firms differ in productivity/marginal cost, then a country closing to trade should experience __________ because __________ productive firms will __________ the industry.
   - A. no change in average industry productivity; the same; remain in
   - B. an increase in average industry productivity; more ; exit
   - C. a decrease in average industry productivity; less ; exit
   - D. a decrease in average industry productivity; less ; enter

5. (3 pts.) If investment demand decreases in a small open economy, then __________ and real interest rates __________
   - A. net exports decrease; are unchanged.
   - B. net exports decrease; decrease.
   - C. net exports increase; decrease.
   - D. there is a net capital outflow; are unchanged.

6. (3 pts.) We know that in antiquity, China exported silk because no one in any other country knew how to produce this product. From this information we know that

   A. China had an absolute advantage, but not a comparative advantage in silk.

   B. China had a comparative advantage in silk.

   C. China exported silk for political reasons even though it had no comparative advantage.

   D. China was unable to profit by exporting silk because it was unknown in the rest of the world.

7. (3 pts.) In a small open economy, if exports equal \$ 15 billion and imports equal \$8 billion, then there is a __________ and __________ net capital outflow.

   A. deficit; positive

   B. surplus; positive

   C. surplus; negative

   D. deficit; negative

8. (3 pts.) If the market for products produced by firms in a monopolistically competitive industry becomes __________, then there will be __________ firms and each firm will produce __________ output and charge a __________ price.

   A. smaller; fewer; less; lower

   B. smaller; fewer; more; higher

   C. smaller; fewer; less; higher

   D. smaller; more; less; higher

9. (3 pts.) In an open economy

   A. a trade deficit is always bad.

   B. a trade deficit may be good or bad.

   C. a trade deficit is always good.

   D. a trade surplus is always bad.

10. (3 pts.) A product is produced in a monopolistically competitive industry with increasing returns to scale. If this industry exists in two countries, and these two countries engage in trade with each other, then we would expect

    A. the countries will trade only with other nations they are not in competition with.

    B. the country in which the price of the product is lower will export the product.

    C. each country will export different varieties of the product to the other.

    D. neither country will export this product since there is no comparative advantage.

11. (35 pts.) **Cuba.** As an aid to Senator Kirsten Gillibrand (D, NY) in the US Congress you continue study the economic impacts Cuba's opening to trade on their economy.

A summer intern complied some information that may be of use:

Cuba is a small open economy and their economy can produce manufactures and sugar. The technology to produce manufactures and sugar both only use labor and they have constant marginal products of labor. The marginal product of labor in manufactures is 18. The marginal product of labor in sugar production is 24. And the total quantity of labor in the economy is 100 units.

a. (7 pts.) Treating Cuba's economy as currently in autarky, what is the relative price of sugar to manufactures?

So we know from free mobility of labor that

$$\frac{P_S}{P_M} = \frac{MPL_M}{MPL_S} = \frac{18}{24} = \frac{3}{4}$$

So if Cuba sells one unit of sugar, it recieves $\frac{3}{4}$ units of manufactures in return.

b. (7 pts.) Please carefully explain two issues (i) at what set of world relative prices would Cuba export sugar? and (ii) at what set of world prices Cuba export manufactures?

Per the discussion above, as long as the $\underline{\frac{P_S}{P_M} > \frac{3}{4}}$

Cuba will want to export sugar. Why??? It will recieve a higher price or more manufactures in return for its sugar. Thus its a good deal.

Now if $\underline{\frac{P_S}{P_M} < \frac{3}{4}}$ cuba will export manufactures

Why??? This implies Cuba can buy sugar cheaper on the world market. So 1 sugar will cost less than $\frac{3}{4}$ of a manufacture. Thus, its a better deal to buy sugar on world market in exchange for manufactures.

For the next two parts, consider the following figure. This figure illustrates both historical and forecasted world prices of sugar relative to manufactures. The forecasted prices were graciously provided by the "Sugar for a Better World Institute". The expected date at which Cuba will open up to trade is indicated as well.

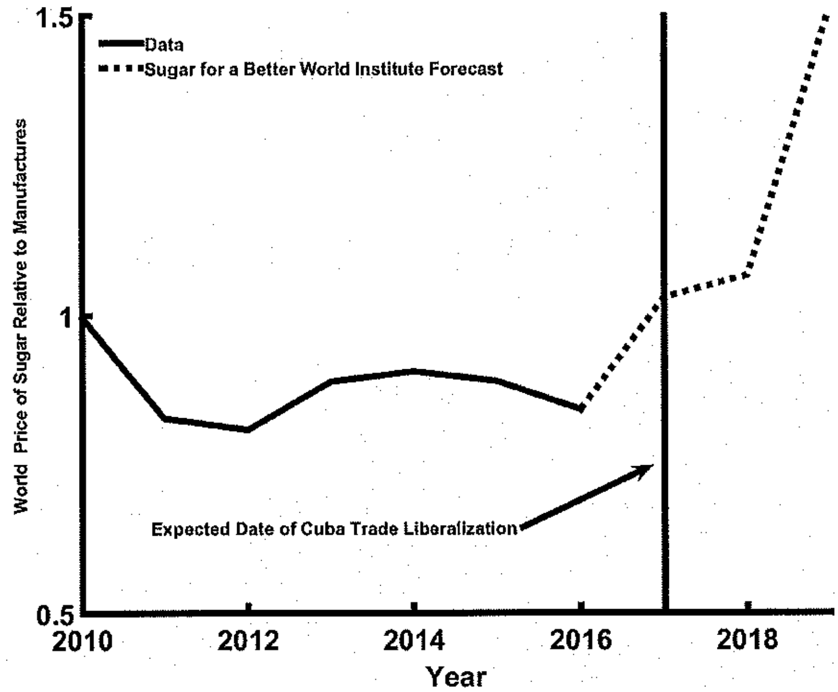


Figure 1: Actual and Forecasted World Price of Sugar Relative to Manufactures

c. (7 pts.) Given the forecasted relative price and assuming complete specialization, provide a forecast of how Cuba's economy will change. Specifically, its pattern of production, exports, and imports as it opens up to trade.

Note the forcasted relative price of sugar, $\frac{P_s}{P_m}$ is > 1

Then we would expect, per disscusion in 2b.

* Cuba specialize in the production of sugar.

* Cuba exports sugar.

* Cuba imports manufactures

d. (7 pts.) Given the forecasted relative price data for 2019, show that Cuba gains (i.e. either in real wages, consumption opportunities, etc) from opening up to trade by specializing in they way described in **part c.**

The key here is to show Cuba gains

I'll do this by looking at real wages, in the units of the commodity, they are importing... - manufactures!

Real Wages (in units of Manuf)

Autarky, $MPL_m = 18$

Open to trade, $\dfrac{MPL_S \cdot P_S^{\tau}}{P_m}$

Why? From (c) all workers work in sugar

Assume from figure that the price is 1.5

$24 \cdot 1.5 = 36$

Real Wages doubled !!!

e. (7 pts.) A colleague suggests that your analysis of Cuba within the Ricardian model of trade provides a very limited view as to the forces by which consumers in Cuba will gain from trade. He suggests that within manufacturing trade, i.e. intra-industry trade, could be very important.

Within the context of our class, discuss two mechanisms (that are distinct from the Ricardian model) in which Cuban consumers will gain from trade.

The idea here is that the gains from trade for Cuba may be broader then just exchanging sugar for manufactures . . . .

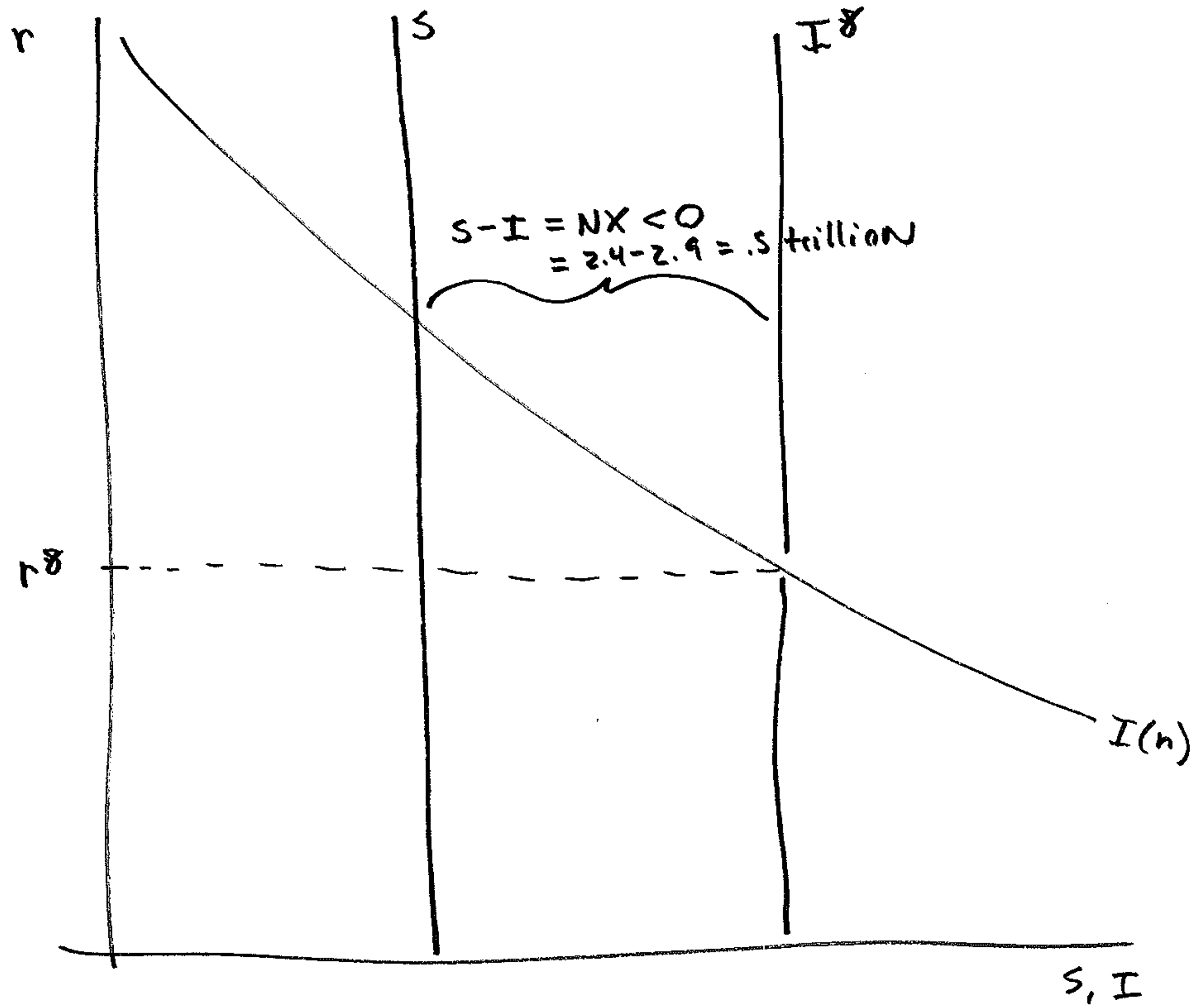
(1) Gain from variety. Even if Cuba specializes in sugar, the variety of manufactures it will have access to will increase. This is good for consumers as they will have more choices to chose from. This is not preasent in the Ricardian model.

(2) Lower prices from competion. In the Ricardian model, there is a sense in which the price of manufactures goes down as the country opens up. But this is just from Comp. Advantage. In the M.C. model, prices decline because there is more foreign competion. Consumers benefit as they can now purchase varieties of manufactures at these low prices.

12. (35 pts.) **Feel the Bern—Again.** Senator Bernard "Bernie" Sanders (I, VT) as part of his Presidential platform is proposing a single payer health care system. Senator Sanders system is expected to cost one trillion dollars per year. He proposes that various tax increases will make this plan deficit neutral. Thus, taxes are expected to increase by one trillion.

    Pleas revisit this plan with in the context of a small-open economy.

    a. (7 pts.) In 2015, United States exports are 2.4 trillion dollars; imports are 2.9 trillion dollars. Carefully illustrate savings, investment, net exports, and the world real interest rate that corresponds with the 2015 situation of the United states.



This is current situation in U.S.

b. (7 pts.) Illustrate and carefully explain how Senator Sanders plan changes: national savings, investment and net-exports.

So national Savings . . . .

$$S = \underbrace{Y - T - \beta(Y-T)}_{\text{Private Savings}} + \underbrace{(T - G)}_{\text{Public Savings}} \qquad \downarrow$$

Sanders plan has no ~~effect~~ on Public Savings, why? Its deficit neutral. But it will affect private savings as Households face the tax burden, reducing disposable income, consumption, savings.

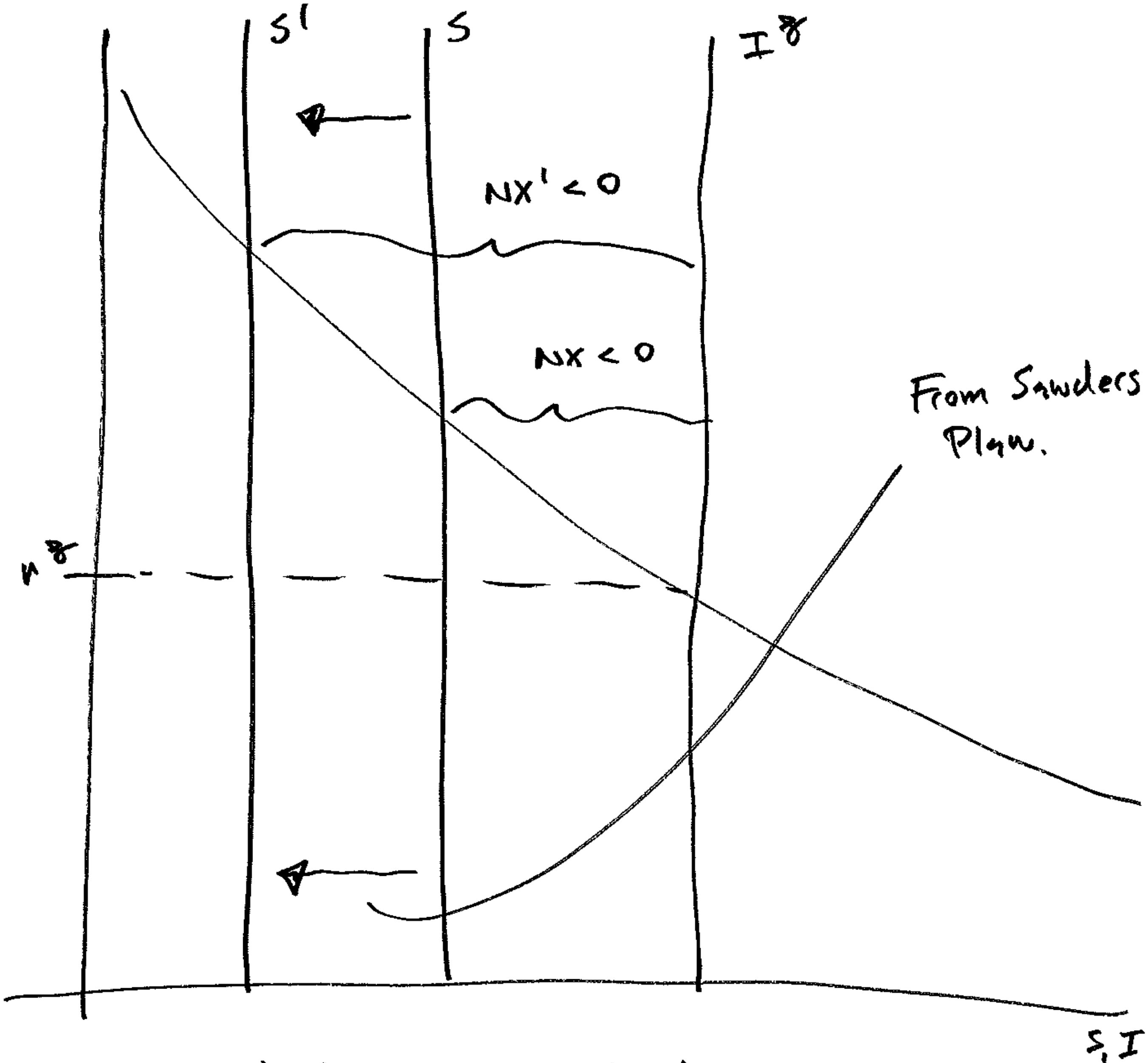
Investment No change. Why? It is pinned down by the fact that we can borrow at r^* to finance all the neccessary investment.

Net-Exports $\downarrow$ Why? $\underbrace{S}_{\substack{\downarrow \text{ as} \\ \text{it crowds} \\ \text{out private} \\ \text{savings}}} - \underbrace{I}_{\substack{\text{No} \\ \text{change}}} = \underbrace{NX}_{\downarrow}$

Extra Space

Clearly label the question number, and leave a reference to this page near the question.

So to illustrate this...



In a nut shell, how do we afford his plan....
We borrow from abroad.

c. (7 pts.) Some commentators (both Democratic and Republican) speculate that this plan would be a disaster for the US economy. Carefully explain the impact of Senator Sanders plan on real GDP in the *near the future*. That is one to two years after his plan is enacted.

We know that investment connects with capital in the future, so....

$$K_{t+1} = (1-\delta)K_t + I_t$$

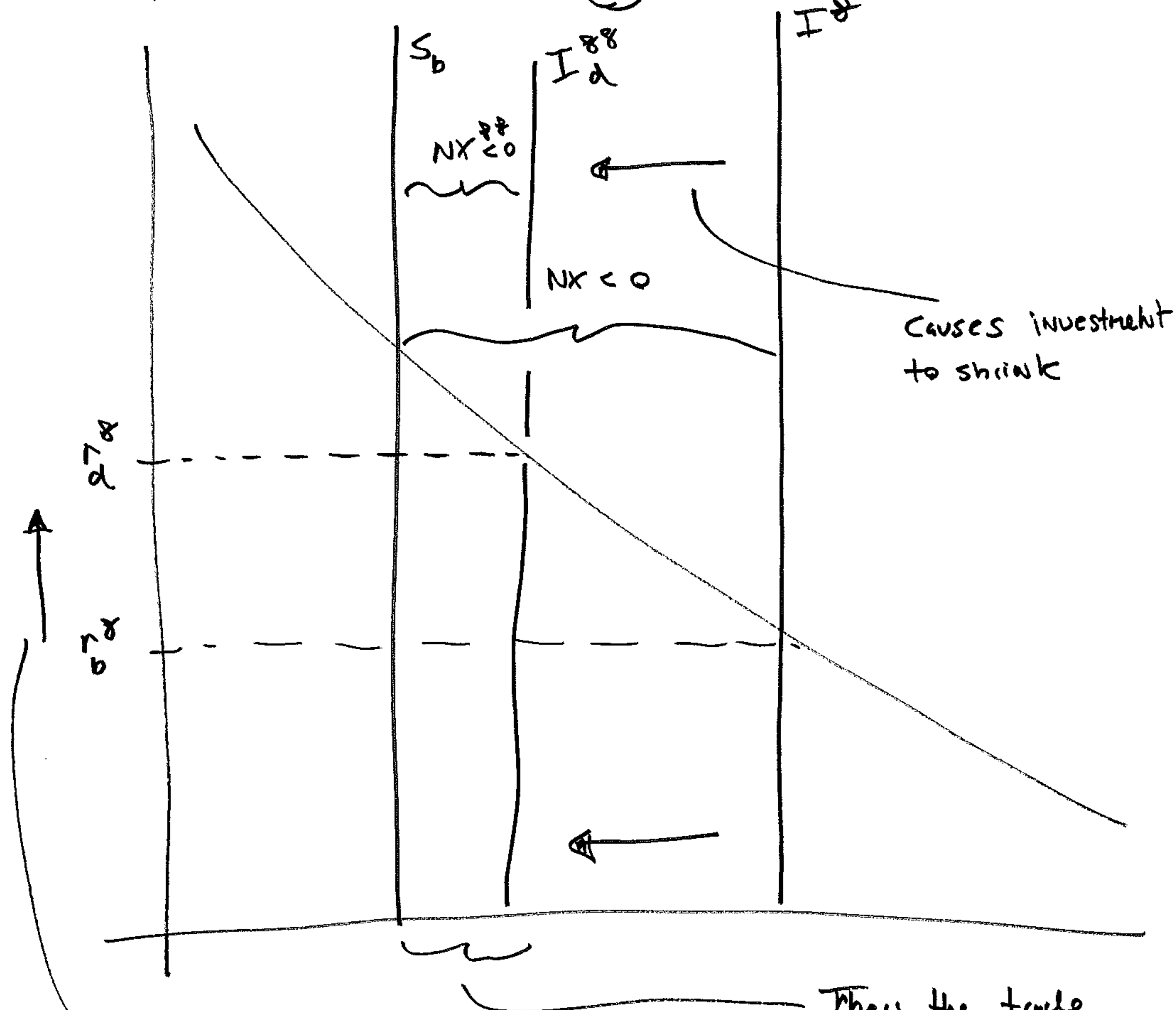
And then GDP is determined by $Y = F(K, L)$.

Now in (b) we argued that sanders plan has <u>NO effect</u> on I. This is the key feature of the small open economy model.

Thus as I does not change, K, will not change, then real GDP in the near future will not change.

d. (7 pts.) Suppose that Senator Sanders plan leads to an increase in the world real interest rate. Carefully illustrate and describe how national savings, investment, and net-exports would change *relative* to your answer in part **b.**

So lets start with (b)



Then the trade deficit contracts as well.

Increase in world interest rates

e. (7 pts.) Assume that the world real interest rate does not change. And assume that the marginal propensity to consume is 0.75. Please provide a quantitative estimate of how much Senator Sanders plan would increase the trade deficit.

First, because the world intrest rate does not change, this implies ~~we~~ investment is fixed, and thus an change in the trade deficit is from the change in savings.

$$S_{(bernie)} - S_{(No\ bernie)} =$$

$$\underbrace{Y - T_b - \beta(Y - T_b) + (T_b - G_b)}_{S_{bernie}} -$$

$$\underbrace{Y - T_N - \beta(Y - T_N) + (T_N - G_N)}_{S_{No\ bernie}}$$

$$=$$

$$(T_N - T_b) + \beta(T_b - T_N)$$

$$=$$

$$(1 - \beta)(T_N - T_b) = 0.25 \times (-1 \text{ trillion})$$

$$= -0.25 \text{ Trillion}$$

So savings decrease by -0.25 trillion

Then since

$$\Delta NX = \Delta S$$

This implies the trade deficit expands/worsens by -0.25 trillion.

For each question below, **write the letter of the most correct answer to the left of the question.**

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