Final Exam. Econ520. Fall 2022

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UNC

Instructions:

- Answer all questions.
- Write legibly.
- Write your answers on the question sheets. Use additional pages, if needed.
- *Explain* your answers – do not just state them.
- *Show* your derivations – do not just state the final result.
- Do not refer to any notes or books. You may use a calculator.
- The total time is **180** minutes. The total number of points is **120**.

Name:	PID:

1 Short Questions: Open Economy

Be sure to explain your answers. No models are required.

1. [6 points] President Clinton once said that each nation is "like a big corporation competing in the global marketplace." Was he right? What happens when a country has low productivity?

   Answer

   No. Competitiveness is not a concept that applies to countries (or persons). Firms go out of business when their productivity is low relative to that of competitors. Countries do not.

2. [6 points] Some argue that trade deficits are a consequence of a strong dollar. Others argue the reverse: the strong dollar is caused by the trade deficit. Which argument is correct?

   Answer

   Neither. Both are endogenous. Depending on the shock, the trade deficit and the exchange may move together or not.

3. [6 points] Explain why you agree or disagree with the following statement:

   "Blocking imports without changing underlying savings and investment levels would simply raise the value of the dollar and cause exports to fall as well, leaving the deficit unchanged..." ("The U.S. Trade Deficit: How Much Does It Matter?", Council on Foreign Relations, 2021).

   Answer

   The key is $I = S^P + S^G - NX$, making this statement true by definition. The value of the dollar would have to change so that NX can stay the same, even though imports become more expensive.

4. [8 points] Do low wages in China cause our trade deficit? How can we export to China, if wages there are very low?

   Answer

   The key is again $I = S^P + S^G - NX$. Low Chinese wages do not have a clear effect on domestic saving. They may redirect investment from the U.S. to China. That might increase the trade balance. So the answer is "likely no." We compete with China by adjusting the exchange rate to the point where we are competitive in products where we have a comparative advantage.

5. [12 points] Explain the "impossible trinity" of exchange rate regimes. How do different regimes attain two out of three goals, but never all three.

Answer

There are 3 goals: exchange rate stability, open capital mobility, and monetary autonomy.

There are 3 "pure" regimes that fully get 2 goals by sacrificing the 3rd

(a) Float: the CB ignores the exchange rate, so we have monetary autonomy. Capital flows can be open, but the exchange rate is volatile.

(b) Peg: the CB is fully occupied with the exchange rate. We get the other 2 goals.

(c) Capital controls: FX can only be bought and sold through a government agency. The exchange rate is a government choice (b/c markets don't clear). Money supply can do what it wants. But capital is immobile.

2 Short Questions: Methods

1. [10 points] It is often said that correlation does not imply causation. This question asks you to apply this saying to a specific case.

   In the data, countries with tropical climates and thus lots of tropical diseases are typically poorer than more northern, cooler countries. Suppose a researcher estimates the causal effect of climate on output by regressing (using OLS) a country's per capita GDP on its average temperature.

   Explain why the OLS regression coefficient may not represent a causal effect. Under what conditions would it be valid to interpret the regression coefficient as a measure of the causal effect.

   Answer

   The main concerns with OLS are (i) reverse causality (not an issue in this example) and (ii) omitted variable bias.

   Omitted variables cause problems because the OLS coefficients pick up indirect cause-effect chains, such as "climate → institutions (omitted variable) → output." And also accidental correlations, such as:

   - climate and institutions are accidentally correlated (e.g., because good institutions happened to emerge in Europe)
   - institutions cause growth

   Therefore, for OLS to work, there must not be any omitted variables that are correlated with climate and that cause output to vary.

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2. [5 points] Suppose a researcher regresses per capita output Y/L on measures of physical K/L and controls $\mathbf{X}$:

$$\log(Y_i/L_i) = \alpha + \beta_k \log(K_i/L_i) + \mathbf{X}_i\gamma + \varepsilon_i \tag{1}$$

   In words, what does a coefficient $\beta_k = 0.5$ mean?

   Answer

   Holding everything else fixed (especially the $\mathbf{X}$), a country with 10% more capital has, on average, 5% more output. A conditional correlation. The coefficient says nothing about causality.

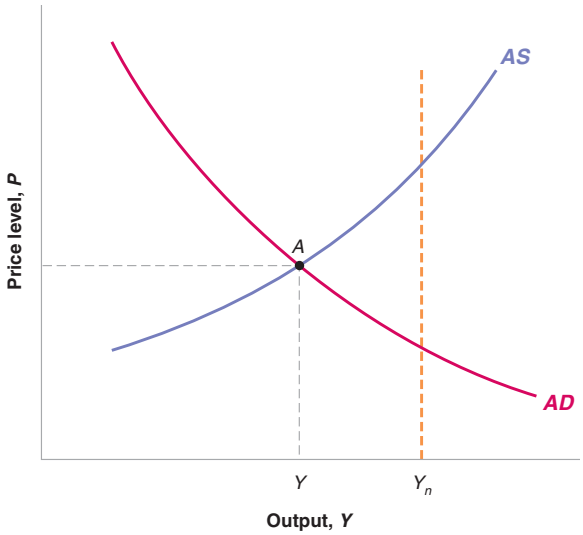

Figure 1: Open economy AS/AD

3 Getting to Full Employment

Consider a fixed exchange rate open economy that is currently in recession ($Y < Y_n$). Discuss the benefits and drawbacks of three approaches for getting back to full employment:

1. [15 points] Do nothing.
2. [15 points] Increase government spending.
3. [15 points] Currency devaluation.

Also discuss the implications for the trade balance. Show your reasoning in a graph. Recall the model equations:

$$UIP : i = i^* \tag{2}$$
$$LM : M/P = YL(i) \tag{3}$$
$$AD : Y = C(Y - T) + I(Y, i) + G + NX(Y, Y^*, \bar{E}P/P^*) \tag{4}$$
$$AS : Y = F\left(\frac{1}{1+m}\frac{P}{P^e}, z\right) \tag{5}$$

Answer

The graph looks like a closed economy AS/AD model. See 1.

1. Option 1: do nothing

Over time, AS shifts down because prices are lower than expectations. We get a prolonged period of falling prices, rising (but below full employment) output. In the background, AD rises because falling prices improve NX. The main drawback: it can take a long time to get to full employment.

2. Government spending: AD shifts right. In principle, the economy can get to full employment right away. Higher prices and output imply a lower trade balance.

   Benefits: fast; benefits the other country.

   Drawbacks: fiscal deficits; inflation; in practice: takes time to implement.

3. Devaluation: AD shifts right, but this time because the lower exchange rate improves the trade balance.

   Benefits: fast and quick to implement; trade balance improves (if that is a benefit)

   Drawbacks: inflation; damages credibility of the peg.

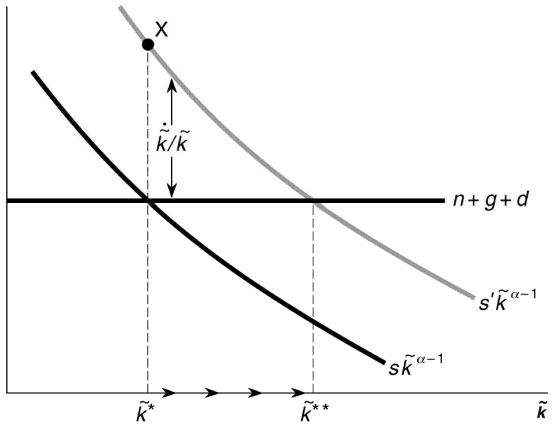

Figure 2: Solow Model

4 Solow Model

Recall that the Solow model gives rise to the following law of motion for per capita capital:

$$\dot{k}_t = sA^{1-\alpha}k_t^{\alpha} - (n+\delta)\,k_t \tag{6}$$

Questions

1. [11 points] Graph the growth rate of k against k. What does it say about how the growth rate depends on the capital stock? Explain the economic intuition.

   Answer

   Start by plotting $g(k)$ against k and note that the graph is downward sloping. See Figure 2.

   With a constant saving rate $g(k)$ converges to 0. The growth rate is simply a function of how far the economy is from the steady state.

   The basic intuition comes from diminishing MPK. When K/L is low, MPK is high. This implies that Y/K (average product of K) is high. Therefore I/K is high and that produces fast growth. As k rises, diminishing MPK implies that I/K falls, but depreciation (relative to k) stays the same. Growth runs out of steam.

2. [11 points] Suppose the country experiences a baby boom (a permanent increase in the population growth rate n). What happens to k over time? Illustrate your answer in a graph. Explain the economic intuition.

   Answer

   The $(n+\delta)$ curve shifts up. The initial k stays the same.

Steady state k drops (the usual demographic dilution effect).

For given k, $g(k)$ declines, so that k falls over time towards the new steady state.

Intuition: The demographic drag gets stronger. A larger fraction of saving is devoted to simply keeping capital per worker constant as population grows. That's why $k = K/L$ falls over time. Of course, as k falls, MPK rises, which counteracts the demographic drag.

End of exam.