This exam is 50 minutes long. Points per question are proportional to the time indicated. You will have 3 extra minutes (for a total of 53 minutes) to take this exam. Please write clearly; illegible answers will receive no credit. Label all graphs. **Calculators are not allowed.**

1. Write your name, your Harvard student ID number, your section leader's name, and your section time on this sheet.

2. **Do not write your name on your bluebooks.** To ensure anonymous grading, write only your Harvard student ID number, your section leader's name, your section time, and the bluebook number **on each bluebook** that you use.

3. Use **three** bluebooks for this exam. You may write on this exam, but you will only be given credit for answers written in the bluebook.

4. Use one exam booklet for each bluebook section of the exam. **You must hand in all 3 bluebooks.**
1. (3 minutes)

Consider the productivity slowdown in the U.S. during the 1970s and 1980s. List and explain three factors mentioned in section which may have been responsible for this phenomenon. For each factor, relate your explanation to one of the variables in the equation for productivity growth.

2. (2 minutes)

List and explain the two factors that promote absolute convergence in GDP per capita.

3. (5 minutes)

The following information describes the economy of Nova Latifundia:

   GDP per capita growth rate = 4% per year.
   Population growth rate = 2% per year.
   Labor force participation rate and savings rate are constant over time.
   Growth rate of the capital stock = 2% per year.

Assume capital’s share of output is 30% and labor’s share is 70%.

(a) (2 minutes)

   Compute the growth rate of total factor productivity (TFP). Show your work.

(b) (3 minutes)

   Approximately how long will it take consumption to double? Show your work.
4. (7 minutes)

Johnny Fatcat withdraws $15,000 from his checking account at The DL Bank. He pays $10,000 to Sammy Loanshark, who puts the money in his checking account at The Sopranos Bank. Johnny uses the other $5,000 as paper for his hand-rolled cigarettes, all of which he smokes ("nothing smokes better than a $100 bill," he loves to tell his friends).

Assume that all banks hold only the required 10% reserves and always loan out the rest, and that no cash is held by the public.

(a) (2 minutes)

What is the net effect on the money supply in the economy? Show your work.

Assume instead that Sammy uses the $10,000 he receives to pay back a loan from Bad Boys Bank. $8,000 goes to repay the loan itself, and $2,000 represents his interest payment.

(b) (3 minutes)

Show the effect of Sammy’s payment on Bad Boys Bank’s balance sheet.

(c) (2 minutes)

What will be the total amount of new loans in the economy after Sammy’s payment? Show your work.
1. (6 minutes)

After doing some research on the Internet, Mark is considering investing his life savings in corporate bonds. He's not really sure what they are, however, and wants you to explain them to him.

(a) (0.5 minutes)

What is a bond?

(b) (2.5 minutes)

What are the two main risks bondholders face? Using the bond pricing equation, explain how each of these risks could affect a bond’s price.

(c) (1.5 minutes)

After consulting with you, Mark decides to put all of his money in ACME company’s bonds. These bonds have a face value of $100 and a coupon rate of 5%, but Mark was able to purchase the bonds for $20 each. The bonds mature in the year 2050. What is the approximate yield on the bonds Mark purchased? Show your work.

(d) (1.5 minutes)

In 2048, Mark decides he wants to sell his ACME bonds. In 44 years, ACME has never missed a coupon payment. The final two coupon payments are still to be paid. Interest rates on comparable bonds are currently at 5%. For how much money will Mark be able to sell each of his bonds? Explain your answer.
2. (10 minutes)

Alice has wants to invest in the stock of XYZ Inc., and is trying to decide whether she should purchase shares, call options or put options. She estimates that, as of April 1 (when the options expire), XYZ stock will be worth one of three possible prices: $48, $63, or $69. She estimates that each of these prices is equally likely.

_For each of the following, be sure to show all of your work._

(a) (1 minute)

If her estimates are in line with those of the market, what will be the market price of XYZ shares?

(b) (2 minutes)

If her estimates are in line with those of the market, what will be the premium of a call option with a strike price of $60?

(c) (2 minutes)

If her estimates are in line with those of the market, what will be the premium of a put option with a strike price of $60?

It turns out that on April 1, XYZ is selling for $48 a share.

(d) (1 minute)

If Alice had purchased shares at the price you calculated in part (a), what is her percentage gain or loss?

(e) (1 minute)

If Alice had purchased call options with a $60 strike price at the premium you calculated in part (b), what is her percentage gain or loss?

(f) (1 minute)

If Alice had purchased put options with a $60 strike price at the premium you calculated in part (c), what is her percentage gain or loss?
(g) (2 minutes)

What is leverage, and how does it help explain the difference in your answers to part (d) as opposed to parts (e) and (f)?
Bluebook III: A Gallimaufry of Lectures and Readings (17 minutes)

1. (6 minutes)
   Consider the *Economist* article “The poor and the rich.”
   
   (a) (2 minutes)
   What are the three assumptions of the neoclassical growth model?
   
   (b) (2 minutes)
   What are the two implications of this model?
   
   (c) (2 minutes)
   What is the implication of empirical work by Robert Barro for the neoclassical model?

2. (2 minutes)
   Recall the article “Sizzling Economy Revitalizes India” from *The New York Times*.
   
   (a) (1 minute)
   What are the three bases for the Indian economic surge mentioned in the article?
   
   (b) (1 minute)
   Which of the three approaches to development detailed in section (and in the introduction/background to Sachs’s essay in the study questions) seems to be borne out by the Indian experience? Why?

3. (2 minutes)
   A long-established principle of finance says that assets with higher risk should reward investors with higher returns. According to Professor Campbell, why have long-run returns on gold been low in comparison with the returns on stocks and bonds, despite gold’s high volatility (risk)?

BLUEBOOK III CONTINUES ON NEXT PAGE
4. (4 minutes)

In his lecture, Professor Shleifer presented two theories as to why legal origin matters for the development of financial markets. What are they? Briefly discuss how they help explain the differences in the development of financial markets in common law as opposed to civil law countries?

5. (3 minutes)

Using the Social Security “rate of return” equation Professor Feldstein presented in lecture, explain why current retirees have received a high rate of return on their contribution to the Social Security system, and why future retirees will likely not see returns which are as high.