

**COURSE 180.101
MACROECONOMICS
EXAM #2 (Two Hours)**

NOVEMBER 7, 2017

NAME _____

TA* _____
SECTION* _____

***Two points if you write down the name of your TA and section number correctly**

Section I (20 points)

1. Name both the outgoing Chair and the new Chair of the U.S. Federal Reserve Board.
2. In the AD/AS model, we identify an equilibrium price level, and an equilibrium level for output. In the real world we tend to think in dynamic equilibrium terms. Specify the variables, and plausible values for these variables, for dynamic equilibrium in the USA:
3. As of 2016, Bolivia's GDP per capita is \$3,000, less than one-tenth the level of the USA. The Solow growth model identifies three ways in which labor productivity can grow. What would most likely be a central part of lifting Bolivia's productivity and GDP per capita?
4. Name the four categories of U.S. government spending that comprise more than 3/4s of total Federal government spending:
5. Define ex-ante and ex-post real interest rates.

Section II Financial Markets (20 points)

The following data were obtained on Nov 1, 2017.

Bond	Yield to Maturity
1-yr US Treasury	1.5%
2-yr US Treasury	1.7%
10-yr US Treasury	2.35%
10-yr US TIPS	0.50%
10-yr Ford	3.75%

1. According to the expectations theory of the term structure, what do market participants expect the 1-yr US Treasury rate to be 1 year from now?

2. According to the expectations theory of the term structure, is the average 1-yr Treasury rate for the next 10 years expected to be above or below 2.00% per year? Briefly explain.

3. Why is the 10-yr Treasury rate lower than the 10-yr rate on Ford bonds?

4. Ford currently must pay 140 basis points more per year than the U.S. treasury, if it chooses to borrow money for 10-years. Ford announces it has developed a new battery that will propel its cars 1,000 miles on one charge. Choose the most likely new value for the spread between the Ford bond and the 10-year treasury?
- (i) 180 basis points (ii) 100 basis points (iii) -20 basis points
5. If you expect inflation to average 3.00% per year over the next 10 years, would you prefer to hold 10-yr TIPS or Treasuries? Briefly explain.
6. The bankruptcy of Lehman Brothers, one of the largest investment banks in the US, in September 2008 was one of the most dramatic events of the financial crisis. What do you expect happened to corporate bond yields in the months after the failure of Lehman? And to government bond yields?
7. The expectations theory of the term structure is incomplete – after accounting for the expected path of interest rates, the 10-yr Treasury rate is usually higher than the 1-yr Treasury rate. What is the main explanation for that? (2 points)

Section III Phillips Curve (20 points)

1. Write down the Phillips Curve equation. (2 pts)
2. What is the mandate of the Federal Reserve? What is the mandate of the European Central Bank? (2 pts)
3. Suppose the economy is characterized by having $\alpha = 0.2$, $U^* = 5\%$, and $\pi^e = 2\%$, and the economy is currently in a recession with the unemployment rate at $U_t = 8\%$. What is the implied inflation rate π_t ? (2 pts)
4. Based on current π_t and U_t rank the likely response of the ECB and Fed: (2 pts)

ECB response:
Strongly Tighten, Moderately Tighten, Moderately Loosen, Strongly Loosen (circle one)

Fed response:
Strongly Tighten, Moderately Tighten, Moderately Loosen, Strongly Loosen (circle one)

The nation of Balonia, in the early 1980s, experiences a long recession. At the start of the recession, 1979, inflation is very high. The Table below provides details for the performance of unemployment in Balonia over the four years of recession.

Assume the Phillips curve perfectly predicts inflation each year. Assume further that expected inflation in year t equals actual inflation in year $t-1$

Calculate the path for inflation, 1980 through 1983, and fill in the blanks in the table below:

(4 pts)

	BALONIA			
		(assume $U^* = 6\%$)	(assume $\alpha = 1$)	1979: $\pi = 12.5\%$
	expected	unemployment	natural rate	Phillips curve
	inflation	rate	of unemployment	inflation forecast
1980		8.0%		
1981		9.0%		
1982		9.0%		
1983		8.0%		

Balonia has two more recessions. Again, assume that the Phillips curve perfectly predicts inflation each year. The tables below depict the performances for unemployment and inflation.

BALONIA				
		(assume $U^* = 6\%$)	(assume $\alpha = ???$)	1988: $\pi = 5.5\%$
	expected	unemployment	natural rate	Phillips curve
	inflation	rate	of unemployment	inflation forecast
1989	5.5%	8.0%	6.0%	5.1%
1990	5.1%	9.0%	6.0%	4.5%
1991	4.5%	9.0%	6.0%	3.9%
1992	3.9%	8.0%	6.0%	3.5%

BALONIA				
		(assume $U^* = 6\%$)	(assume $\alpha = ???$)	2007: $\pi = 3.5\%$
	expected	unemployment	natural rate	Phillips curve
	inflation	rate	of unemployment	inflation forecast
2008	3.5%	8.0%	6.0%	3.3%
2009	3.3%	9.0%	6.0%	3.0%
2010	3.0%	9.0%	6.0%	2.7%
2011	2.7%	8.0%	6.0%	2.5%

- By how much did the inflation rate change, in each of the three recessions from the first year of the recession (1980, 1989 or 2008) to the last year provided in the tables (1983, 1992 or 2011)? (2 pts)

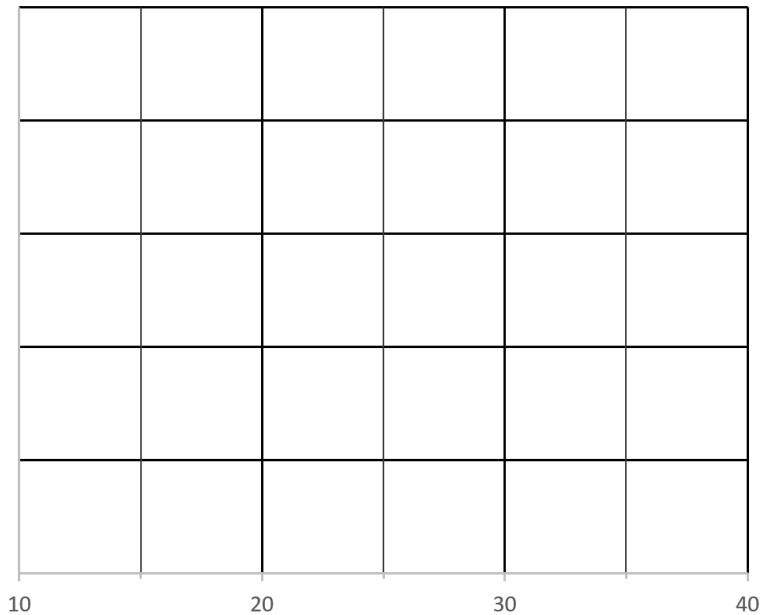
Section IV Loanable Funds and AD/AS (39 points)

In 2024, the U.S. has been growing for 2 years, following a mild recession. The unemployment rate is 5%, the level of real GDP is \$25 trillion and inflation is running at 1.5%. The 10-year U.S. t-note yield is 2.5%. The 10-year yield for corporate debt is 6%. The government will borrow \$100 billion in 2024.

In the 2024 Presidential Election, Tom Hardy runs on the promise of enacting a large infrastructure program, intended to build 200 electric car-charging spaces at every Service Station on U.S. Interstate Highways. He recognizes the program will be costly, adding \$50 billion per year to government spending. He promises that the program will create many new jobs. Moreover, he argues, the effort will propel the U.S. economy into the future.

Laura Tyson, an economist at U.C. Berkley, evaluates Tom Hardy’s infrastructure plan. Laura is a very strong believer in green energy, so she supports Tom Hardy’s plan. However, she is not enthusiastic about the employment effects of the infrastructure program. She thinks that the program will lead to only moderate job gains in the short term, and no job gains in the long-run. A key assumption in her analysis is her view that the natural unemployment rate for the economy is 5.5%.

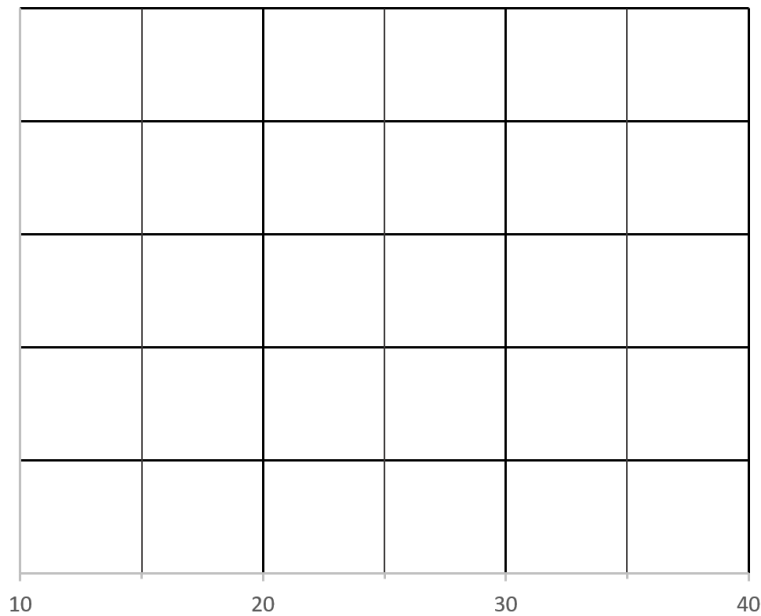
- 1) Use both the data provided on the economy, as well as Laura’s judgment on 2024 macroeconomic conditions, to represent the U.S. economy in the AD/AS space before the infrastructure investment.



- 2) Now use the chart you made above to show how the infrastructure program would affect the economy. Draw the graph to support Laura’s view on job creation both in the short and long-run.

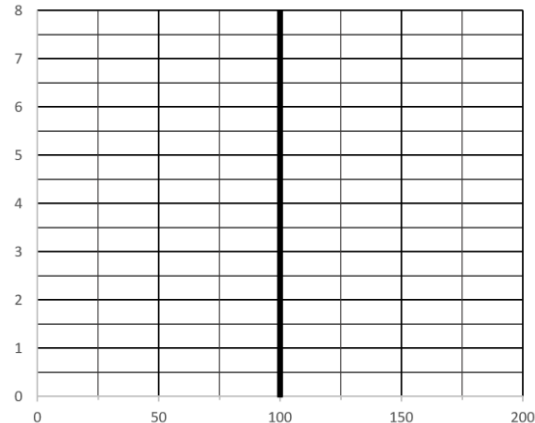
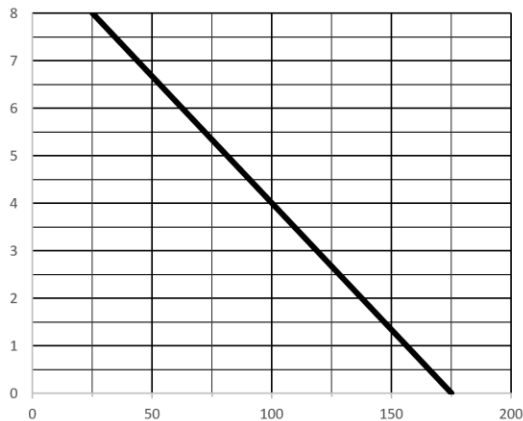
- 3) Larry Ball, an economist at the Johns Hopkins University, also evaluates Tom Hardy’s infrastructure plan. Larry is also a very strong believer in green energy, so he also supports Tom Hardy’s plan. Different from Laura, he thinks that the infrastructure program can lead to large and permanent job gains. He believes that the economy is currently operating below capacity – specifically, he thinks the natural rate of unemployment is 2.5%.

In the quadrant below, use Larry’s view on 2024 macroeconomic conditions to represent the U.S. economy in the AD/AS space before the infrastructure investment.



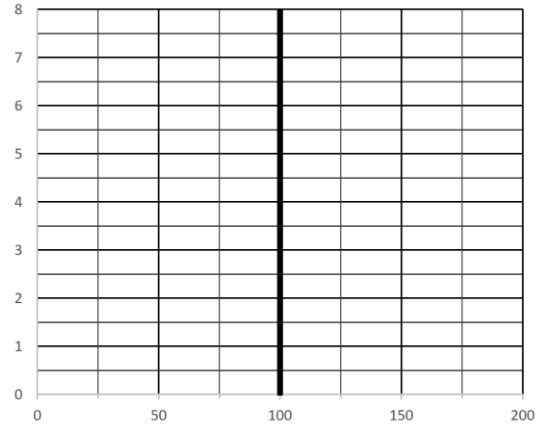
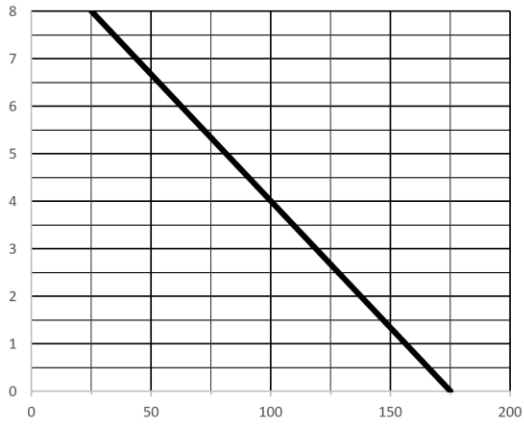
- 4) Now use the chart you made to show how the infrastructure program would affect the economy, according to Larry.

- 5) Both economists supplement their AD/AS analysis with loanable funds graphs. Label the axes and curves in the loanable funds quadrants below. (2 points)



- 6) Draw the additional curves needed to establish equilibrium conditions in the loanable funds market. Draw equilibrium in both markets so they are consistent with the relevant information provided in the beginning of this section.
- 7) Laura was skeptical about the expansionary job effects of the infrastructure program. Correspondingly, she does not think that the program will increase total lending in the economy. In the two quadrants above, represent the effects of the infrastructure program, in a way consistent with Laura's view.
- 8) Larry Ball, on the other hand, thinks that the infrastructure program will be expansionary. He is aware of Laura's concerns. However, he thinks that the infrastructure spending will also cause other 'shifts' in the economy. What effect does he think the spending program will have on both households' and borrowers' risk attitudes?

9) In the graphs below, draw the effect of the infrastructure program on the government and corporate debt markets, in a way consistent with Larry's view.



10) Tom Hardy is not sure if Laura or Larry is right. He recognizes that their analysis has different predictions for the supply of credit in the corporate loan market. He thinks to himself "If I announce a large spending program, and _____ falls, then I will know Larry is right." Fill in the blank.