

Econ 308  
Intermediate Macroeconomic Theory  
Whitman College  
Spring 2014

Denise Hazlett  
Office: Maxey 224  
Phone: 527-5155  
Email: hazlett@whitman.edu  
Cleo email address for the course:

Office hours are the following, or by appointment:  
MWF 2:40-3:30  
TTh 10:30-11:30

Macroeconomics covers economic activity at the aggregate level. We study national income, employment, growth, business cycles, inflation, interest rates, exchange rates, trade balances, government debt and deficits, financial crises, and monetary and fiscal policy. The textbook is Macroeconomics, 8th Edition by Gregory Mankiw. You are also required to read the *Wall Street Journal* (WSJ) daily and summarize relevant articles about the United States macroeconomy. You will turn in these summaries periodically, and use them to write a paper analyzing U.S. macroeconomic policies. The paper assignment and the requirements for the WSJ articles are attached. The WSJ assignment is worth 150 points. There are three midterm exams worth 100 points each (Friday February 21, Friday April 4, Friday May 2), a comprehensive final exam worth 200 points (the morning of Friday, May 16) and eight problem sets worth 10 points each. I will drop your lowest problem set score. The first four problem sets are attached to this syllabus, and their due dates marked on the reading schedule.

Please arrange your schedule now so that you do not have conflicts with the exam dates. I will not offer exams at times other than those scheduled. If you have a registered disability that requires special accommodation for exams, see me a week before each exam so we can make arrangements. As a courtesy to others, do not leave class except in emergencies. All cell phones and laptops must be turned off and packed away during class. If you need your computer for taking notes in class, come see me. I will ask you to consult the staff at the Academic Resource Center about optimal note-taking.

The grading scale for the course is as follows. Note that there is no disadvantage to studying with others, as your grade does not depend on anyone else's performance. To help you study, old exams are posted at <http://people.whitman.edu/%7ehazlett/econ308/econ308.html>. Two textbook supplements are on reserve at Penrose: a student study guide, and a solutions manual for the problems at the end of the textbook chapters.

Total points	(% of 720)	Grade	Total Points	(% of 720)	Grade
706	0.98	A+	554	0.77	C+
670	0.93	A	526	0.73	C
648	0.90	A-	504	0.70	C-
626	0.87	B+	482	0.67	D+
598	0.83	B	454	0.63	D
576	0.80	B-	432	0.60	D-

## Wall Street Journal Article Summaries and Paper Assignment

Regularly following the macroeconomic news reported in the *Wall Street Journal* (WSJ) will help you understand the theoretical and policy issues we cover in this course. During the semester you are required to summarize at least 70 WSJ articles on the United States macroeconomy. The summaries you turn in must be your own work, designed to help you write the paper described in this assignment. Because the WSJ does not check its op-ed pieces for accuracy, *you will not hand in summaries of opinion or editorial pieces*. Op-ed articles are located towards the end of Section A on pages labeled as opinion pages.

The articles you will summarize fall into the following two categories:

(1) **United States Macroeconomic Data** These articles discuss newly released macroeconomic data for the U.S., including changes in real gross domestic product, the current unemployment rate, the inflation rate, savings rates, labor productivity measures, survey results for consumer and business confidence, and the trade deficit. Do not collect the article on the U.S. dollar exchange rate the WSJ publishes daily in its Money and Investing section. Knowing what happened to the value of the dollar over a 24-hour period would not give you a broad enough perspective to help you write a paper covering three months of macroeconomic activity. Similarly, do not collect articles describing stock market changes over the past few days.

Note that macroeconomic data describe the economy in the aggregate. So, do not collect articles on the performance of individual firms or particular industries. For instance, you *would* collect an article describing how much the Consumer Price Index changed over the past 12 months, due in part to changes in oil prices. However, you would *not* collect an article describing what happened to the profits of steel companies due to changes in oil prices.

(2) **United States Macroeconomic Policy** These articles discuss U.S. fiscal or monetary policy and include articles on federal government spending and taxation, the federal government budget deficit and debt, social security and tax reform and other federal government budget proposals, government design and implementation of financial regulatory reform, and Federal Reserve actions affecting credit conditions and financial stability. Do not collect any article that merely states how much debt the Treasury has issued or paid off over the past few days, as these articles do not describe policy, but instead cover the technical details of how the Treasury finances Congress's deficit spending.

As you write each summary, you should consider it a resource for when you write your paper at the end of the semester. With clear, relevant and detailed summaries, you will find you need to go back and reread very few of your 70 articles. Some articles require only one or two sentences in summary, whereas others merit longer summaries. Type your summaries in an MS Word file, dividing them into the two categories (data and policy), and ordering them chronologically, with a **complete citation** for each: the **date, article title, author's name, and WSJ page number**. Note that even if you are accessing the WSJ electronically, every published article *does* have a page number. You must include that page number in your citation. If I have questions about one of your summaries, I will use your citation to find the article. Because articles located in the WSJ.com blogs section (as opposed to the published articles) tend to be ephemeral and therefore not findable later, if you are writing a summary of one of these blog

articles, you must include the entire blog article in your assignment, in addition to your summary. The first **15** WSJ summaries are due Friday, February 7 (15pts). Email them to me (hazlett@whitman.edu), in MS Word (.doc or .docx) format. The next **20** are due Friday, March 7 (20pts). The next **25** are due Friday, April 18 (25pts). The final **10** are due Tuesday, May 13 (10pts). You must turn in at least this number of summaries of new articles on each date, but you may turn in more. This assignment requires you to track the news every day for relevant articles, so you likely *will* turn in more than 70 summaries.

When collecting articles and writing the summaries you should keep in mind the following paper assignment. In particular, you should be careful to collect information on all of the U.S. macroeconomic policy proposals discussed at the federal level over the course of the semester.

In the paper, due by 3pm Tuesday, May 13, you will

- (i) summarize U.S. macroeconomic performance over the course of the semester, based on the information from your data-tracking articles,
- (ii) summarize current and proposed U.S. monetary and fiscal policies, based on the information from your policy articles
- (iii) use economic theories from the course to explain the rationale for current and proposed policies, and
- (iv) use economic theories from the course to analyze the likely macroeconomic effects of these fiscal and monetary policies.

In other words, you will use economic models from the course to analyze the performance of the U.S. macroeconomy, to explain how this performance has influenced policy proposals, and to predict how these policies would in turn affect the economy. You will need to use multiple economic models in your analysis because some models are designed for analyzing short-term economic performance, some are designed for long-term analysis, and some for very-long-term analysis. Your paper should treat all three time frames. Referring to graphs from the models will help you explain your analysis. You can hand draw your graphs in your appendix, but you must explain in the body of the paper what is happening in each graph and how you are using that graph in your analysis. Your paper should be about 12 double-spaced pages, not including the graphs.

The summaries are worth 70 points and the paper 80 points. For help improving your writing, Dierdre McCloskey's Economical Writing is on reserve at Penrose.

You can subscribe to the WSJ (giving you print and electronic access to the WSJ's Western Edition), read the library's print copy of the Western Edition, or use the library's electronic subscription which gives you stripped-down access to the Eastern Edition. Unfortunately, the library's electronic subscription does not distinguish between news articles and op-ed pieces. If you use the library's e subscription, you are responsible for checking to make sure you have no op-ed pieces in your collection. You can use the library's print edition to do that checking. Buying your own subscription gives you online access that *does* distinguish between news and op-ed pieces, plus provides neat interactive resources. I recommend you get a subscription. With the student discount, a 15 week subscription is \$15, available at [wsj.com/spring14](http://wsj.com/spring14). If you do get your own subscription, go to the "today's paper" link to find the published paper, which will give you complete citations (including page numbers) for the articles.

## Reading Schedule

- W Jan 22      Wall Street Journal:  
*Fed Eyes Bubble Risks in Markets* by Jon Hilsenrath & Victoria McGrane, 1/9/14 A1  
*Hiring Slowdown Blurs Growth View* by Brenda Cronin and Jonathan House, 1/11/14 A1  
*Path Clears for a Pick Up in Business Investment* by Neil Shah 1/13/14 A2  
*Budget Deal Gives Parties a Break From Fiscal Combat* by Janet Hook 1/15/14 A4  
*House Passes Spending Bill* by Janet Hook 1/16/14 A6
- F Jan 24      The financial system: Read Chapter 20 and p. 91 (of chapter 4) in textbook, and read the 1/3/14 speech by Ben Bernanke “The Federal Reserve: Looking Back, Looking Forward.” Bring to class the speech and your answers to the discussion questions on p. 6 of syllabus.
- M Jan 27      Continue discussing the financial system’s effect on the macroeconomy  
Textbook p. 513 graph of housing price bubble, p. 498 graph of investment (in chapter 17)
- W Jan 29      CPI, Nominal and real Gross Domestic Product, chapters 1 and 2 of textbook
- F Jan 31      Real GDP, unemployment and Okun’s Law, pp. 274-279 of textbook
- M Feb 3      Distributing national income, pp. 47-58
- W Feb 5      Example of factor price changes, p. 58      PROBLEM SET 1 Due in class
- Fri Feb 7      Cobb-Douglas production function, pp. 58-63, and the Solow Growth Model, pp. 205-208  
WSJ SUMMARIES DUE, emailed to hazlett@whitman.edu
- M Feb 10      Output, consumption, investment and depreciation in the SGM, pp. 208-211
- W Feb 12      Steady state and savings in the SGM, pp. 211-217
- F Feb 14      Golden rule steady state, pp. 217-224      PROBLEM SET 2 due in class
- W Feb 19      SGM with population growth, pp. 224-232, and p. 26 “FYI: Percentage Changes”
- Fri Feb 21      EXAM 1
- M Feb 24      Technological progress in the SGM, pp. 235-253, 256-9
- W Feb 26      Accounting for sources of economic growth, pp. 262-8, 244-245
- F Feb 28      The natural rate of unemployment, chapter 7      PROBLEM SET 3 due in class
- M Mar 3      Inflation and interest rates, pp. 110-113
- W Mar 5      The monetary system, banks and the Federal Reserve, chapter 4
- F Mar 7      The money supply and Fed tools, pp. 92-99  
WSJ SUMMARIES DUE, emailed to hazlett@whitman.edu
- M Mar 10      Inflation and the Quantity Theory of Money, the classical dichotomy pp. 101-110, 126-127
- W Mar 12      Costs of inflation, pp. 116-128  
PROBLEM SET 4 due in class
- F Mar 14      No class (enjoy break!)

- M Mar 31 The open economy: savings, investment and the trade balance, pp. 133-142, 146-149  
W Apr 2 Exchange rates, inflation and purchasing power parity, pp. 149-150, 156-163  
F Apr 4 EXAM 2
- M Apr 7 The Keynesian Cross model, pp. 273-285, 303-308  
W Apr 9 Government tax and expenditure policy in the Keynesian Cross model, pp. 308-314  
F Apr 11 IS-LM model: Deriving the IS curve from the Keynesian Cross model, pp. 314-317
- M Apr 14 IS-LM model: Deriving the LM curve, pp. 317-325  
W Apr 16 Fiscal and monetary policy in the IS-LM model, pp. chapter 12  
F Apr 18 Deriving aggregate demand from the IS-LM model, pp. 338-339  
Long run aggregate supply and the natural rate hypothesis, p. 417  
WSJ SUMMARIES DUE, emailed to hazlett@whitman.edu
- M Apr 21 Short run aggregate supply assuming fixed nominal wage contracts  
Short-run fluctuations caused by shifts in aggregate demand, pp. 397-401, 403-405  
W Apr 23 Automatic adjustment back to the natural rate of output, p 405  
Short run fluctuations caused by oil price shocks and wage-price spirals  
F Apr 25 Imperfect information and the Lucas short run aggregate supply curve, pp. 401-402
- M Apr 28 Inflation-unemployment trade-off in the Phillips Curve, pp. 406-413  
W Apr 30 Disinflation and the sacrifice ratio, the Lucas Critique pp. 414-417, 526-7  
F May 2 EXAM 3
- M May 5 Hysteresis and the challenge to the natural-rate hypothesis, p. 417-419  
Should macro policy be active or passive, by rule or by discretion? chapter 18  
W May 7 Stabilizing output versus stabilizing inflation  
F May 9 Government deficits and debt, chapter 19
- M May 12 Unresolved questions of macroeconomics, pp. 593-600
- May 13 WSJ SUMMARIES and PAPER due by 3pm
- F May 16 Final exam

To prepare for our class discussion on **Friday, January 24**, read chapter 20 of the textbook and read the January 3, 2014 speech “The Federal Reserve: Looking Back, Looking Forward” by Federal Reserve Chairman Ben Bernanke, at <http://www.federalreserve.gov/newsevents/speech/bernanke20140103a.htm>.

Answer the following discussion questions. Bring a copy of the speech and your answers to class.

1. Consider Mr. Bernanke’s observation about the flexible inflation-targeting regimes that central banks in several countries had adopted before our own Federal Reserve did so in January of 2012. He notes that these central banks were “often pursuing economic objectives in addition to low and stable inflation.” What economic objectives does the Fed pursue, in addition to low and stable inflation?

2. According to Mr. Bernanke, what did the Fed do during the 2008-2009 global financial crisis and its aftermath to support the Fed’s democratic legitimacy?

3. Why did the bursting of the housing bubble in 2006 cause a global financial crisis and deep recession, whereas the bursting of the dot-com bubble in 2000, which also caused a large reduction in paper wealth, was followed by only a mild recession?

4. Mr. Bernanke notes Bagehot’s Rule for dealing with a liquidity crisis: have the government lend to solvent financial intermediaries that offer good collateral, to stop runs by their creditors.

(a) Define each of the following:

Speculative bubble

Financial intermediary

Bank capital (in addition to chapter 20, see page 91 in chapter 4)

Leverage ratio (see page 91 again)

A solvent bank

Illiquid assets

Liquidity crisis

Lender of last resort

Adverse selection

Moral hazard

Fire sale

Money Market Mutual Fund

Shadow banking system

(b) According to Mr. Bernanke, what did the Fed do to stabilize the financial system during the global financial crisis of 2008-2009?

(c) How has oversight of the U.S. shadow banking system been strengthened since the crisis?

5. (a) What unconventional monetary policy tools has the Fed used since the crisis?

(b) What evidence does Mr. Bernanke give to show those tools have been effective?

(c) What factors have held the United States macroeconomy back from full recovery?

6. Why is the current mix of loose monetary and tight fiscal policy “particularly problematic when interest rates are very low, as is the case today”?

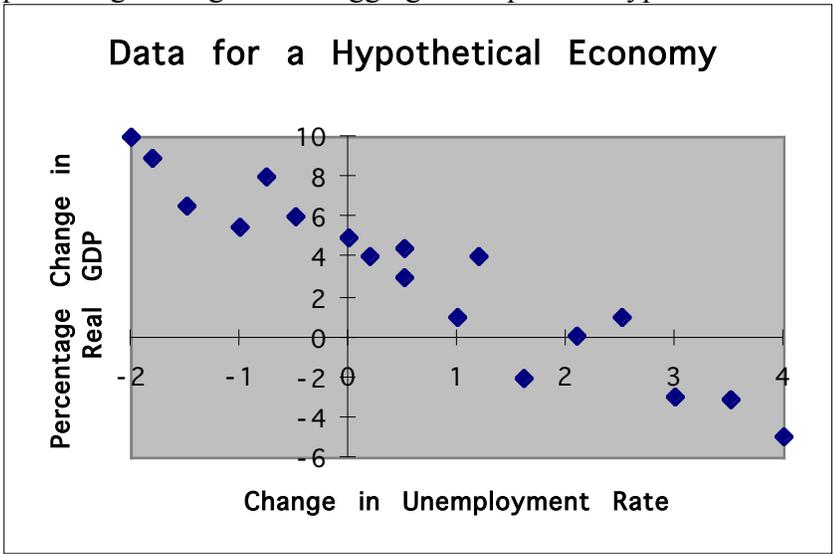
PROBLEM SET 1 Due at the beginning of class Wednesday, February 5. Show your work.

1. Consider the following information about the goods produced within the borders of a hypothetical country. Answer the following questions, showing all of your work.

Good	Price in 2002	Price in 2003	Amount produced in 2002	Amount produced in 2003
Carrots	\$10	\$12	100,000	110,000
Ambulances	10,000	9,800	10	10
Jeans	20	19	10,000	10,500
Bicycles	200	220	1,000	1,020

- (a) (1pt) In 2002, the typical urban family bought 30 carrots, 8 jeans and 1 bicycle. With 2002 as the base year, calculate the Consumer Price Index for 2003.
- (b) (1pt) Use the CPI calculated in part (a) to determine the inflation rate between 2002 and 2003. Suppose the CPI is 120.0 in 2004. What is the inflation rate between 2003 and 2004?
- (c) (3pts) What is the Gross Domestic Product deflator for 2003, if 2002 is the base year? Use the **geometric mean (chain-weighted)** calculation.
- (d) (1pt) Use the GDP deflator in part (c) to determine the inflation rate between 2002 and 2003.

2. Consider the following graph of annual data relating the change in the unemployment rate to the percentage change in real aggregate output in a hypothetical economy.



- (a) (2pts) Estimate Okun’s Law for this hypothetical economy.
- (b) (1pt) Using your version of Okun’s Law, estimate the effect on aggregate output if the unemployment rate in this economy were to fall from 6.5% to 6.0%.
- (c) (1pt) Using your version of Okun’s Law, estimate the effect on aggregate output if the unemployment rate in this economy were to rise from 8.25% to 9.0%.

PROBLEM SET 2 Due at the beginning of class Friday, February 14. Show your work.

1. (2pts) Find an internet site that provides interesting information about macroeconomics. Describe the information the site provides, who authored the site, and why you find it interesting. Email your description to the Cleo email address for the course, [ECON\\_308\\_A\\_S14@cleo.whitman.edu](mailto:ECON_308_A_S14@cleo.whitman.edu).

2. Consider the Cobb-Douglas production function where real aggregate output  $Y$  is given by  $Y = AK^\alpha L^{(1-\alpha)}$  in which  $A=2$  is a parameter measuring the productivity of the available technology,  $K$  is the amount of capital employed,  $L$  is the amount of labor employed, and  $\alpha=0.4$  is the share of national income paid as compensation to capital. The depreciation rate in this economy is 0.05, the savings rate is 0.25, and the size of the population is constant.

(a) (2pts) Find the steady-state level of capital per worker.

(b) (2pts) Find the steady-state level of national output per worker.

(c) (1pt) Find the steady-state level of consumption per worker.

(d) (3pts) Suppose the savings rate changes to 0.20. Find the new steady-state levels of capital per worker, national output per worker, and consumption per worker.

PROBLEM SET 3 Due at the beginning of class Friday, February 28. Show your work.

1. Consider the three countries described below. Each country has a Cobb-Douglas production function  $Y = AK^\alpha L^{(1-\alpha)}$ , where  $Y$  is the amount of real aggregate output produced,  $K$  is the amount of capital employed,  $L$  is the amount of labor employed,  $A$  is a parameter measuring the productivity of the available technology, and  $\alpha$  is the fraction of national income paid as compensation to capital. There is no labor-enhancing growth in technology in any of the countries. For each country, determine whether the country is producing at, above, or below the golden rule level of capital accumulation.

(a) (1pt) Country A.  $K = 100, L = 200, A = 2, \alpha = 0.3$   
Depreciation of the capital stock  $\delta = 0.05$ . The labor force grows at the rate  $n = 0.2$ .

(b) (1pt) Country B.  $K = 50, L = 50, A = 1.5, \alpha = 0.2$   
Depreciation of the capital stock  $\delta = 0.1$ . The labor force grows at the rate  $n = 0.2$ .

(c) (1pt) Country C.  $K = 200, L = 50, A = 1, \alpha = 0.4$   
Depreciation of the capital stock  $\delta = 0.05$ . The labor force grows at the rate  $n = 0.15$ .

2. Consider the Cobb-Douglas production function where real aggregate output  $Y$  is given by  $Y = A K^\alpha (LxE)^{1-\alpha}$ , in which  $A = 60$  is a parameter measuring the productivity of the available technology,  $K$  is the amount of capital employed,  $L$  is the amount of labor employed, and  $\alpha = 0.25$ . Here,  $E$  indicates the effectiveness of each worker, so that  $LxE$  is the amount of effective workers employed (also called the number of efficiency units of labor). The annual depreciation rate in this economy is 0.05, the savings rate is 0.35, the population grows at the annual rate of 0.03, and the measure of labor effectiveness,  $E$ , grows at the annual rate of 0.01.

(a) (2pts) Suppose that the current amount of capital per effective worker,  $k = K/(LxE)$ , is 2000. Find the amount of capital per effective worker next year. At next year's level of capital per effective worker, what is output per effective worker ( $y = Y/(LxE)$ ), and consumption per effective worker ( $c = C/(LxE)$ )?

(b) (1pt) Find the steady-state level of capital per effective worker.

(c) (1pt) In the steady-state, at what rate does real aggregate output  $Y$  change?

(d) (1pt) In the steady-state, at what rate does real aggregate output per worker  $Y/L$  change?

(e) (2pts) Find the golden-rule steady-state level of capital per effective worker.

PROBLEM SET 4 due at the beginning of class Wednesday, March 12. Show your work.

1. Consider a hypothetical economy. Suppose that the labor force is fixed at 100,000 people, of which 10,000 are currently unemployed and 90,000 employed. Suppose that the monthly rate of job separation  $s=0.013$ , and the monthly rate of job finding  $f=0.165$ .

- (a) (0.5pt) What is the current unemployment rate?
- (b) (0.5pt) How many people will lose jobs over the coming month?
- (c) (0.5pt) How many unemployed will find jobs over the coming month?
- (d) (0.5pt) What will the unemployment rate be at the end of the month?
- (e) (0.5pt) What is the natural rate of unemployment for this economy?
- (f) (0.5pt) When this economy is operating at the natural rate of unemployment, how many people will find a job in a month?

2. Suppose Lisa lends to Brad at an annual nominal interest rate ( $i$ ) of 7%.

- (a) (1pt) If both people expect the inflation rate to be 3% over the coming year (that is,  $\pi^e=3\%$ ), what real interest rate ( $r^e$ ) do they expect on the loan?
- (b) (1pt) If the actual inflation rate turns out to be 1% (that is,  $\pi=1\%$ ), what is the actual real interest rate ( $r$ ) on the loan?

3. Consider the following model. The banking industry holds one kind of deposit, a checking deposit. The money supply is defined to be currency in the hands of the public ( $C$ ) plus deposits ( $D$ ). The monetary base is currency in the hands of the public plus reserves ( $R$ ) in the banking industry. Assume that the public holds some currency and that banks hold some excess reserves ( $ER$ ). Let  $r_D$  be the required reserve ratio on deposits. Suppose the currency to deposit ratio is 0.2, the excess reserves to deposit ratio is 0.05, and the required reserve ratio is 0.15.

- (a) (1pt) What is the money multiplier for this economy?
- (b) (1pt) Describe an open market operation that would cause the money supply to ultimately rise by 60 million dollars.
- (c) (1pt) If the central bank were to sell 10 million dollars of government Treasury bills, what exactly would ultimately happen to the money supply?

4. Assume that the classical quantity theory of money holds. Suppose that over a 20-year period, real aggregate output grows on average by 2.9% per year.

- (a) (1pt) If, during this 20-year period, the money supply grows on average 3.2% per year, what will the average annual inflation rate be?
- (b) (1pt) Suppose that during this 20-year period, lenders require an annual real interest rate of 3.1%. Assume that everyone knows that the money supply will grow on average 3.2% per year and that real output will grow on average 2.9% per year. Use the Fisher equation to predict the annual nominal interest rate.