Disclaimer: The review may help you prepare for the exam. The review is not comprehensive and the selected topics may not be representative of the exam. In fact, we do not know what will be on the exam. We try to make our answers complete, but we cannot guarantee their correctness. Use at your own risk and use good judgment.

We will <u>NOT</u> answer any questions about the essay topic. Please refer to Spring 1999 Final Exam essay for an example of a structured answer.

- 1. Remember to separate microeconomics and <u>macroeconomics</u> in your head. They both operate under different assumptions and describe different components of the economy. Microeconomics focuses more on the relationship between society, consumers, and producers. Macroeconomics looks at the <u>big picture</u> or the economy as a whole. Think of micro as the trees, and macro as the forest.
- 2. There are three big measures in macroeconomics: gross domestic product, unemployment, and inflation!
- 3. Real gross domestic product (Y) is another name for aggregate **income**. Gross domestic product is also another name for aggregate **output**. GDP is also another name for aggregate **expenditures**. I simultaneously refer to aggregate output, aggregate income, aggregate expenditures, and real gross domestic product when I use the word "output".

Final Exam Review: Macroeconomics

GDP, Unemployment, and Inflation

$4. \mathbf{Y} = \mathbf{C} + \mathbf{I}^{\mathbf{A}} + \mathbf{G} + \mathbf{N}\mathbf{X}$

(always true)

- 5. $I^A = I + H$, I = Planned Investment, H = Unplanned changes in inventory
- 6. GDP Accounting is not difficult if you remember a few rules of thumb:
 - a. Consumption is done by households
 - b. Investment spending is done by firms (and sometimes by households, if households buy new real estate)
 - c. Government spending is done by local, state, and federal governments, but the weird thing is that almost anything that the government purchases can be considered as government spending (even intermediate goods and services)
 - d. Foreign people buy our exports
 - e. Households, firms, and government buy imports
 - f. Count NEW goods and services (not used)
 - g. Count FINAL goods and services (not intermediate)
 - h. Count goods and services made in the specified period (not goods and services from previous years)
- 7. Every person in our economy fits into the following categories:
 - a. Employed
 - b. Unemployed
 - c. Out of the labor force
- 8. If someone is unemployed, then she must meet <u>ALL</u> three conditions:
 - a. Age 16+
 - b. Jobless
 - c. Looked for a job in the last 4 weeks
- 9. Inflation is the percentage change in price levels.
- 10. There are three methods to measure the price level: CPI, PPI, and GDP Deflator
- 11. Inflation = $(CPI^{new} CPI^{old}) / CPI^{old}$
- 12. Inflation benefits borrowers and hurts lenders
- 13. There are THREE BIG PROBLEMS with CPI (Case&Fair):
 - a. Quality change and new product bias: the CPI does not immediately take into account either improvements in the quality of goods and services or the introduction of new products
 - b. Substitution bias: the CPI assumes that consumers purchase a constant mix of various goods and services despite changes in their relative prices (think about the law of downward sloping Demand)
 - c. Outlet substitution bias: the CPI does not adequately take into account that new discount stores offer lower prices (Walmart & Costco) and entice consumers away from traditional outlets (Albertsons & Safeway) that tend to be more fully represented in the CPI market basket

Final Exam Review: Macroeconomics

Keynesian Cross Model

Goods & Services Market

Closed-economy Version

- 14. Assume closed economies which mean no exports and no imports. This means that NX=0.
- 15. Planned Aggregate Expenditures = **PAE** = **C**+**I**+**G**+**NX** [remember that this is always true because this is a definition]
- 16. Remember that "I" stands for planned investment spending.
- 17. **Y=PAE** [remember that this is true in equilibrium]
- 18. Net taxes = Taxes Transfer Payments = $\mathbf{T} = \mathbf{TA} \mathbf{TR}$
- 19. Disposable income = income after net taxes = $Y^d = Y-TA+TR = Y-T$
- 20. Autonomous consumption spending is consumption spending when aggregate income is zero. This is the idea that households need to spend and purchase goods and services even when aggregate income is zero.
- 21. Marginal propensity to consume = portion of one extra dollar of income that is consumed
- 22. Consumption Spending = C = a + (b)(Yd)
- 23. C = a + (mpc)(Y-TA+TR)
- 24. Remember that households can choose to do two things with their aggregate income: consume or save.
- 25. There are three fiscal closed-economy multiplier effects (assume T is constant):
 - a. Government spending multiplier = 1/(1-mpc)
 - b. Net Tax multiplier = -mpc/(1-mpc)
 - c. Balanced Budget multiplier = 1
- 26. There are three types of expansionary fiscal policies
 - a. Raise government spending (ΔG)
 - b. Lower net taxes (ΔT)
 - c. Raise both government spending and net taxes by the same amount
- 27. Budget deficit = G T

Open-Economy Version

- 28. Assume the economy is open to trade which implies NX>0, NX<0, or NX=0.
- 29. Assume T is a constant.
- 30. Assume imports (IM) is proportional to domestic output (Y). In other words, the more income the economy has, the more the economy will import from foreign countries.
- 31. Marginal propensity to import (mpm) = the change in imports caused by \$1 change in income = $\Delta IM/\Delta Y$
- 32. The multiplier effect is smaller in an open economy than in a closed economy because when government spending (or investment spending) increases and income and consumption rises, some of the extra consumption spending that results is on foreign products and not on domestically produced goods and services. (Case&Fair)

Final Exam Review: Macroeconomics

Money Market & Bond Market

- 33. Money is anything that is generally accepted as a medium exchange.
- 34. An increase in bank reserves leads to a greater than one-for-one increase in the money supply. The change in the money supply divided by the change in reserves is called the money multiplier: 1/(required reserve ratio)
- 35. The Federal Reserve (the Fed) can engage in expansionary monetary policy by:
 - a. Lowering the required reserve ratio
 - b. Lowering the discount rate
 - c. Buying government bonds (open market operations)
- 36. The Fed can engage in contractionary monetary policy by:
 - a. Increasing the required reserve ratio
 - b. Increasing the discount rate
 - c. Selling government bonds (open market operations)
- 37. Increases in the interest rate (r) decreases planned investment spending (I) because cost of borrowing goes up. Assuming externally financed.
- 38. Decreases in the interest rate (r) increases planned investment spending (I) because cost of borrowing goes down. Assuming externally financed.
- 39. An increase in income raises money demand which raises interest rates. Assume Ms target.
- 40. A decrease in income lowers money demand which lowers interest rates. Assume Ms target.
- 41. Money market effects REDUCE Keynesian effects. Assume Ms target.
- 42. Keynesian effects REDUCE money market effects. Assume Ms target.
- 43. Remember that in today's economy, the Fed does not use a money supply target. The Fed engages in Federal Open Market Operations to TARGET THE INTEREST RATE (r).
- 44. The price of bonds and the interest rate are INVERSELY related. When P^b goes up, then r falls. When P^b goes down, r rises.
- 45. The interest rate is the cost of borrowing (externally financed) or the required rate of return (internally finance).
- 46. READ THE ATTACHED APPENDIX 1 ON MONETARY POLICY.

Final Exam Review: Macroeconomics

Foreign Exchange (FX) Market & Net Exports

- 47. Absolute advantage tells us absolutely nothing about whether two countries should trade.
- 48. Each country should specialize in its comparative advantage and trade. Assuming the terms of trade are acceptable to both countries, then both countries will be able to consume <u>beyond</u> their domestic production possibilities frontiers.
- 49. Balance of Payments = Current Account (CA) + Capital Account (KA) = 0
- 50. BOP = CA + KA = 0
- 51. Balance of trade does not equal Balance of payments
- 52. CA = NX + Net Financial Investment Income + Net Transfer Payments
- 53. KA = (Change in foreign private assets in the US Change in private US assets abroad) + (Change in foreign government assets in the US Change in US government assets abroad)
- 54. The balance on the **current account** shows how much a nation has spent on foreign goods and services, investment income payments, and transfers relative to how much it has earned from other countries. The country's net wealth position is the sum of all its past current account balances. The balance on the current account shows how much a nation has spent on foreign goods, services, investment income payments, and transfers relative to how much it has earned from other countries. When the current account balance is negative, a nation has spent more on foreign goods and services (plus investment income and transfers paid) than it has earned through the sales of its goods and services to the rest of the world (plus investment income and transfers received).
- 55. The balance on the **capital account** is the change in the net wealth position of the country vis-à-vis the rest of the world. If the balance on <u>capital account is positive</u> (which means the <u>current account is negative</u>), this means that the change in foreign assets in the country is greater than the change in the country's assets abroad, which is a <u>decrease in the net wealth position of the country</u>.
- 56. -KA = CA
- 57. Changes in relative price levels <u>or</u> relative interest rates shift **both** the demand and supply of FX. In Econ 136 and Econ 182, you will learn about Interest Rate Parity.
- 58. READ THE ATTACHED APPENDIX 2 ON EXCHANGE RATES!!!

Final Exam Review: Macroeconomics

AD-AS Model

- 59. AD curve represents the negative relationship between aggregate output and price level. Each point on the AD curve represents a point at which both the goods & services market, the money market, the bond market, and the foreign exchange market are in equilibrium.
- 60. The AD curve is downward sloping for two reasons:
 - a. Interest-rate effect: P up \rightarrow Md up \rightarrow r up (if we assume a Ms target) \rightarrow I down and NX down \rightarrow Y down via the multiplier effect
 - b. Real Wealth Effect: P up → real wealth down → savings up → C down → Y down via the multiplier effect
- 61. Changes in any of the following components will shift AD: Ms, G, TA, or TR
- 62. AS curve represents the relationship between the aggregate quantity of output supplied by all firms in an economy and the overall price-level.
- 63. The AS curve is upward sloping because Y up → D for inputs up → P inputs up → Price level for output up → P up
- 64. Changes in any of the following components will shift AS: Input costs, economic growth or stagnation, public policy, infrastructural changes, or weather.
- 65. An increase in AD when the economy is operating at low levels of output is likely to result in an increase in output with little or no increase in the overall price level because at low levels of output, resources or inputs are underutilized. Therefore, an increase in AD would not push prices very high.
- 66. An increase in AD when the economy is operating at high levels of output is likely to result in an increase in output with large increases in the overall price level because at high levels of output, resources or inputs in the economy are overutilized. Therefore, an increase in AD would push prices up drastically.
- 67. Read Professor Olney's notes on long-run growth. The quick version is we want to promote policies that shift our PPF to the right which shifts AS to the right.
- 68. Good luck on the exam.

APPENDIX 1. Monetary Policy.

Definitions and terminology

What are you talking about when you say "money supply target" and "interest rate target"?

I am referring to the <u>goals</u> of the Fed's monetary policy tools. Recall that the Fed has three tools to change its monetary policy:

- 1. Change the required reserve requirement ratio
- 2. Change the discount rate
- 3. Change the federal funds rate (through the buying and selling of bonds)

A money supply target means that the Fed uses its tools **in order to** reach a certain money supply level in the economy.

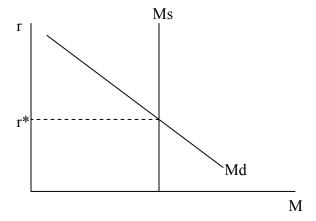
An interest rate target means that the Fed uses its tools **in order to** reach a certain interest rate in the economy.

The Fed rarely changes the reserve requirement ratio and discount rate. Hence, for the purposes of this handout, we are only concerned about the buying the selling of bonds (i.e. Federal Open Market Transactions).

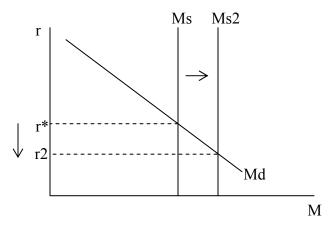
Shift from Money Supply Target to Interest Rate Target

Why did the Fed switch from targeting the money supply to targeting the interest rate?

If we assume that the Fed has complete control over the money supply, then the equilibrium interest rate is determined by the money market (where money demand = money supply).



Lets pretend that the Fed changes its money supply target from \$9 trillion to \$9.5 trillion. Hence the Fed will buy bonds and expand the money supply until the money supply reaches \$9.5 trillion. This is a money supply target: the Fed uses its tools to reach a certain level of money in the economy.

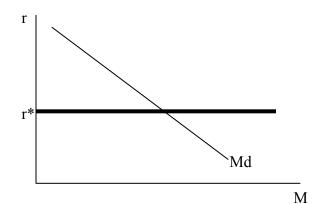


The equilibrium interest rate falls when the Fed expands its money supply target. An increase in the money supply aimed at increasing aggregate output (Y) is called **expansionary monetary policy**. The Federal Open Market Committee (FOMC) basically buys bonds which raises the price of bonds and expands the money supply which results in a lower rate of return on bonds and lower interest rates.

But the Fed realized that a money supply target is difficult and costly to maintain in a world with high financial integration. In other words, the Fed began to lose control of the money supply as financial integration increased. If the Fed wanted to maintain a money target today, then it would have to persistently monitor and intervene in the bond markets to fix the money supply at the target level. Hence the Fed switched to an **interest rate target**.

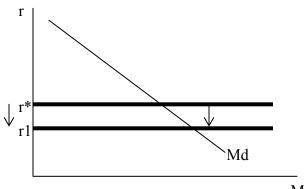
Interest Rate Target and Money Market

If the Fed's interest rate target is at r*, then the money market would look like the following:



Even though I did not draw in a vertical money supply curve, it is still there. But since the Fed is using an interest rate target, then we are not concerned about the position of Ms because the Fed will use its tools to maintain the interest rate at the target interest rate (r*).

Lets assume that the Fed lower its interest rate target from r* to r1. The money market graph would show the horizontal line shift down from r* to r1.



FOMC buys bonds which raises the price of bonds which lowers the rate of return of bonds which lowers the interest rate.

Remember that the interest rate effects of monetary policy do NOT change between a money supply target and interest rate target. The FOMC is still expanding Ms when it buys bonds.

M

Graphically speaking, the difference between a money supply target and an interest rate target is the horizontal lines (interest rate target) and the vertical lines (money supply target).

Conceptually speaking, there is a BIG difference between a money supply target and an interest rate target. Here are the two big differences:

- 1. The closed-economy government spending multiplier is <u>smaller</u> than (1/(1-mpc)) if the Fed maintains a <u>money supply target</u>. Because when G goes up, PAE goes up, Y goes up due to the multiplier effect. But when Y goes up, Md goes up because the economy demands more money to spend their additional income, when Md goes up, then r goes up. A higher interest rate reduces investment spending and reduces PAE and reduces Y. We call this the **crowding-out effect**. Hence Y increases by <u>LESS THAN</u> the increase in G times the multiplier.
- 2. The Fed destroys the crowding-out effect (in the short-run) by using an interest rate target. The closed-economy government spending multiplier is (1/(1-mpc)) if the Fed maintains an <u>interest rate target</u>. Because when G goes up, PAE goes up, Y goes up due to the multiplier effect. But when Y goes up, Md goes up because the economy demands more money to spend their additional income, <u>LUCKILY</u> the Fed expands Ms such that r is <u>UNCHANGED</u>! Hence Y increases by the increase in G times the multiplier.

Bond Markets

The most-used tool to affect the interest rate and/or change the money supply is open market transaction (i.e. the buying and selling of bonds). The buying and selling of bonds always have the same effects on money supply and interest rates. Hence, you will almost always answer questions about the bond markets using the <u>same logic and graphs</u> whether or not the Fed uses a money supply target or interest rate target.

FOMC Action	Bond Price Effects	Money Supply Effects	Interest Rate Effects	Y Effects
Buy bonds	Increase	Increase	Decrease	Increase
Sell bonds	Decrease	Decrease	Increase	Decrease

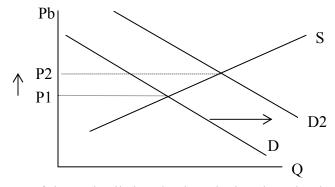
There is an **inverse** relationship between the <u>price of bonds</u> and the <u>rate of return on bonds</u>.

Rate of Return on Bonds = (Face Value - Price) / Price

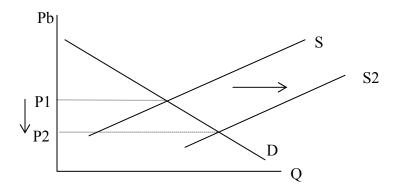
Hence, you can see the inverse relationship between the rate of return on bonds and the price of bonds. Remember that the relationship still holds if you sell the bond before maturity!

There is a **direct** relationship between the <u>rate of return on bonds</u> and the <u>interest rate</u>. Lets look at why there is a direct relationship between the rate of return on bonds and the interest rate. The interest rate is the cost of borrowing. A bond is an IOU. The bond issuer is basically borrowing money from the bondholder. Hence the rate of return on bonds is directly correlated with the cost of borrowing. Remember that the interest rate does NOT equal the rate of return on bonds due to different risks and maturities on different bonds and debts (this is more a finance concept).

If the Fed buys bonds, then the bond market looks like:



If the Fed sells bonds, then the bond market looks like:



Final Exam Review: Macroeconomics

APPENDIX 2. Exchange Rates.

Definitions and terminology

What is an exchange rate (P_{fx}) ?

The exchange rate is the dollar price of foreign exchange. Lets look at a specific exchange rate:

The exchange rate for yen is the dollar price of yen (P_{yen}) . The exchange rate tells me how many dollars I need to buy one yen. It also tells me how many dollars a Japanese person gets when she sells one yen.

More generally, the exchange rate is the number of dollars per unit of foreign currency.

What does it mean the dollar appreciates or gets "stronger"?

If the dollar appreciates, then that means \$1 can buy more yen than before the appreciation. A strong dollar is a dollar that can buy a lot of yen.

What does it mean that the dollar depreciates or gets "weaker"?

If the dollar depreciates, then that means \$1 can buy <u>less yen</u> than before the depreciation. A weak dollar is a dollar that can buy very few yen.

What happens to the dollar when P_{fx} goes up?

The dollar **depreciates**. I know this sounds confusing because the exchange rate is increasing. But remember the exchange rate (in this class) is the dollar price of **yen**. Hence when P_{yen} goes up, then the price of yen goes up, which means yen is relatively MORE expensive than the dollar that implies that the dollar is relatively cheaper.

What happens to the dollar when P_{fx} goes **down**?

The dollar **appreciates**. I know this sounds confusing, but just remember that P_{yen} is the dollar price of **yen**. If the yen is relatively cheaper than the dollar, then the dollar MUST BE relatively more expensive than the yen.

Demand & Supply (revisited)

What is the demand for yen?

Hopefully by now you realize that our simple demand and supply models explain a lot of the world's activities in many pertinent markets that affect our lives and economy.

The <u>buyers</u> are always the people who control the DEMAND curve. The people who buy yen are Americans! Remember that Japanese people who live in Japan DO NOT buy yen. That's as silly as saying that Americans who live in the USA buy dollars. That makes no sense!

Hence, when you think about the demand for yen, think about Americans who want to buy yen!

Why do Americans want to buy yen?

There are two reasons why Americans want to buy yen.

First reason is to buy Japanese goods and services. You realize that when you fly to Japan, that you cannot technically buy any goods and services with your US dollars because the medium of exchange in Japan is yen! Hence, Americans buy yen to buy Japanese stuff (i.e. computers, clothes, magazines, DVDs, and shoes).

Second reason is to buy yen-denominated financial assets. When you graduate from Cal, you are going to start making income. You will seek to maximize the return on your income by "investing" in American stocks, bonds, AS WELL as foreign stocks and bonds. Hence, Americans buy yen to buy Japanese stocks and bonds.

What is the <u>supply</u> for yen?

The <u>sellers</u> are always the people who control the SUPPLY curve. The people who sell yen are the Japanese. Hence, when you think about the supply for yen, think about Japanese people who want to sell yen!

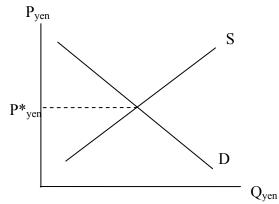
Why do Japanese people want to sell yen?

First reason is to buy American goods and services.

Second reason is to buy American financial assets.

Where is the graph, William?

Finally, you realize the importance of graphs! Look to the right.



Final Exam Review: Macroeconomics

Exchange Rates and GDP

Why should someone who never travels even care about exchange rates?

Exchange rates affect net exports that affect PAE which affect GDP! And we all care about GDP because it measures our national income! And GDP measures our economy's well being.

How does the appreciation of the dollar affect GDP?

If the dollar appreciates (P_{fx} goes down), then the dollar is stronger which means that \$1 can buy more yen than before the appreciation. Imagine that you are an American with dollars that can buy a lot more yens than before. What are you going to do? *If prices remain constant*, then Japanese goods and services are relatively cheaper than American goods and services. Americans will buy more Japanese goods and services, which raises US imports from Japan.

At the same time, American goods and services are relatively more expensive than Japanese goods and services. Japanese people will buy less American goods and services, which reduces US exports to Japan.

The effect is a decline in net exports (NX). Remember that Y = C + I + G + NX. If P_{fx} goes down, NX falls, PAE falls, and Y falls via the multiplier effect. Hence the appreciation of the dollar decreases Y!

So the next time someone tells you that a strong dollar is good for America, then you should say, "Well, GDP (our income) declines if the dollar becomes stronger." **DO NOT FALL FOR THE TRAP THAT A "STRONG" DOLLAR REPRESENTS A "STRONG" AMERICA. THAT'S NOT NECESSARILY TRUE!**

How does the depreciation of the dollar affect GDP?

If the dollar depreciates (P_{fx} goes up), then the dollar is weaker which means that \$1 can buy less yen than before the depreciation. *If prices remain constant*, then Japanese goods and services are relatively more expensive than American goods and services. Americans will buy less Japanese goods and services, which lowers US imports from Japan.

At the same time, American goods and services are relatively cheaper than Japanese goods and services. Japanese people will buy more American goods and services, which increases US exports to Japan.

The effect is an increase in net exports (NX). If P_{fx} goes up, NX goes up, PAE goes up, and Y goes up via the multiplier effect. Hence the depreciation of the dollar increases Y!

So the next time someone tells you that a weak dollar is bad for America, then you should say, "Well, GDP increases if the dollar is weaker."

Interest Rates and Exchange Rates

We have worked with many definitions of the interest rate:

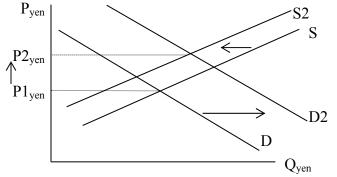
- 1. Cost of borrowing
- 2. Opportunity cost of holding money
- 3. Required rate of return on an investment

Now we are going to add a fourth definition that is very relevant in the foreign exchange market: **the interest rate** (\mathbf{r}^{US}) is the rate of return of dollar assets. Conversely the foreign interest rate (\mathbf{r}^{fx}) is the rate of return on foreign assets.

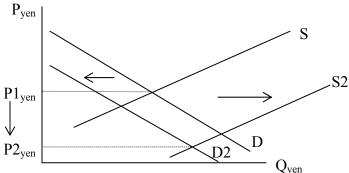
If the Fed lowers the interest rate target, then the dollar will depreciate. If you do not remember how. the Fed is able to lower the interest rate through open market transactions, then you should refer to my "Demystifying Monetary Policy" handout. Lets see what happens in our market for yen when the Fed lowers the interest rate.

Step One. Think about American financial investors. If the interest rate falls, then the rate of return on dollar assets falls. Yen financial assets are relatively more attractive (assuming the Japanese interest rate is higher than the US interest rate). Americans want to <u>buy MORE yen</u> in order to take advantage of the higher rate of return in Japan. Hence demand for the yen increases (shift to the right)!

Step Two. Think about Japanese financial investors. If the US interest rate falls, then the rate of return on dollar assets falls. Dollar denominated assets are relatively less attractive (assuming Japanese interest rate is higher than the US interest rate). Japanese people want to <u>sell LESS yen</u> in order to take advantage of a higher rate of return in Japan. Hence supply for the yen decreases (shift to the left)!



The Fed lowers the interest rate target. The dollar depreciates. The same dollar can buy less yen. If prices are constant, then Japanese goods are relatively more expensive. American goods are relatively cheaper. NX goes up. Y goes up.



The Fed raises the interest rate target. The dollar appreciates. The same dollar can buy more yen. If prices are constant, then Japanese goods are relatively cheaper. American goods are relatively more expensive. NX goes down. Y goes down.

Final Exam Review: Macroeconomics

PRACTICE QUESTIONS

1. OPEC raises oil prices drastically without warning. Show graphically the effects on the aggregate supply curve. Label AS_2 . Label the economy's new equilibrium output (Y_2) and price level (P_2) . Label AD_0 , AS_0 , Y_0 , P_0 as your initial conditions. You must explain the adjustment process.

Final Exam Review: Macroeconomics

2. Consumers are fervent about the bright economic future. Show graphically the effects on the AD-AS model. Label your initial conditions with subscript 0 and your new equilibrium with subscript 2. You must explain the adjustment process.

Final Exam Review: Macroeconomics

3. The economy is in dire despair due to high unemployment. Congress raises government spending in order to stimulate the economy. Assume the Fed maintains a money supply target. Draw the money market model showing the effects of expansionary fiscal policy on interest rates. Label subscript 0 for before the fiscal policy, and subscript 1 for after the fiscal policy. Explain the relationship between output and interest rates.

Final Exam Review: **Macroeconomics**

4. The economy is in dire despair due to high unemployment. Congress raises government spending in order to stimulate the economy. Assume the Fed maintains an interest rate target. Draw the Keynesian-cross model showing the effects of the initial surge in government spending with a subscript 1. Show the crowding-out effects with a subscript 2.

Final Exam Review: **Macroeconomics**

5. Explain why the closed-economy government spending multiplier is SMALLER with a money supply target than interest rate target.

Final Exam Review: Macroeconomics

6. Assume flexible exchange rates. Argentina is currently in a recession. Suppose Argentina's central bank engages in expansionary monetary policy in an effort to bring Argentina out of its recession. Will US imports from Argentina rise or fall? Explain by describing the impact of Argentina's expansionary monetary policy on the exchange rate between dollars and pesos, and the effect of this change in exchange rate on US imports from Argentina.

Final Exam Review: **Macroeconomics**

7. Explain why monetary policy could be more effective than fiscal policy in an open economy.

Final Exam Review: Macroeconomics

8. A US resident purchases a British stock. What is the effect on US assets abroad (increase or decrease)? What is the effect on the foreign assets in the US (increase or decrease)? What is the effect on the US capital account? Net wealth position of the United States? What is the only way a country's net wealth position can change?