

Brigham Young University Department of Economics
Economics 381 – Intermediate Macroeconomics
Winter Semester 2005

Final Exam key

This exam is open book and open notes, and you may use a calculator. Read all questions carefully before answering. Write your answers legibly in the space provided. Keep your answers concise and correct. Points will be deducted for answers which are irrelevant to the question.

Section I (short definitions, 2 points each) Give a one-sentence definition in the space provided.

1. Small open economy
Economy that trades with the rest of the world, but which is too small to have any influence on world prices.
2. Household budget constraint
Constraint on possible consumption bundles imposed by the household's endowment of wealth or resources and the prices of goods
3. Ricardian equivalence
Notion that the method of financing government expenditures has no real effects.
4. Solow residual
The portion of observed economic growth that cannot be attributed to growth in capital or labor inputs.
5. Money multiplier
The ratio of the long-run increase in the money supply to the increase in the monetary base.
6. Monetary base
Currency (both in circulation and vault cash) and reserves of banks held by the monetary authority.
7. IS-curve
All combinations of real interest rate, r , and real output, Y , consistent with market-clearing in the goods market (or investment-savings market).
8. LM-curve
All combinations of real interest rate, r , and real output, Y , consistent with market-clearing in the money market.
9. AD-curve
All combinations of the price level, P , and real output, Y , consistent with market-clearing in both the goods market (or investment-savings market) and the money market.
10. AS-curve
All combinations of the price level, P , and real output, Y , consistent with behavior in the labor market.

Section II (short answer, 5 points each) Where appropriate show your work as this may help in assigning partial credit if you get the answer wrong.

11. Explain the difference between the nominal exchange rate and the real exchange rate.

The nominal exchange rate is the relative price of one currency or money in terms of another currency or money; for example \$ per €. The real exchange rate is the relative value of a basket of goods purchased in one country in terms of baskets of goods from another country. For example, if the real exchange rate between the U.S. and Japan is 1.5, then a basket of Japanese goods could be sold for yen, exchanged for dollars, and used to buy 1.5 baskets in the U.S.

12. Explain the difference between nominal GDP and real GDP.

Nominal GDP is the value of all final goods and services produced within a country's borders within a specified period of time and measured in units of currency. That is, the goods are valued at the actual prices they sold for. Real GDP is the value of the same number of goods when valued at the prices from some base year. Since prices change over time, nominal GDP can change due to price fluctuations. Real GDP will vary only with variations in the number of goods.

13. What are net exports? If a country is a net exporter what does that say about its net savings?

Net exports is the difference between the value of exports of goods and services minus the value of imports of goods and services. With balanced trade, net exports would be zero. If a country has positive net exports it is exporting more than it imports. Since international payments must sum to zero, it must be importing financial assets from foreigners. Hence it is a net saver.

14. Suppose we wish to compare the overall productivity of two countries, Zalchistan & Beluga. Given the information below, which country has the higher level of productivity? By what percent? Assume the capital share in national income is one-third.

	Zalchistan	Beluga	% difference
Real GDP	\$500 billion	\$550 billion	10%
Real Capital	\$1,500 billion	\$1,400 billion	-6.7%
Labor Force	40 million	38 million	-5%
Hours per worker	38 hours / week	38 hours / week	0%

$$\Delta z = \Delta Y - \frac{1}{3} \Delta K - \frac{2}{3} (\Delta N + \Delta H) = .1 - \frac{1}{3} (-.067) - \frac{2}{3} (-.05 + 0) = .1 - .022 - .033 = .155$$

Hence, Beluga has a level of productivity that is 15.5% higher than Zalchistan.

15. What is absolute purchasing power parity? Does it hold for most countries? What does it imply about the real exchange rate?

Absolute PPP is the notion that the price of a broad market basket of goods should cost the same if purchased in domestic currency units domestically, or purchased in foreign currency units and then converted to domestic currency using the nominal exchange rate. That is that $P=eP^*$, where P is the domestic price of the basket, P^* is the foreign currency price of the equivalent foreign basket, and e is the nominal exchange rate in domestic currency per one unit of foreign currency.

Empirically, this condition does not hold for most pairs of countries.

This means that the real exchange rate for most country pairs is not one. In other words, a foreign basket of goods is worth more or less than a domestic basket, but not exactly the same value.

16. Given the following data, calculate the inflation rate from 2004 to 2005.

Good	weight in market basket	2004 price	2005 price
Gasoline	10 gallons	\$1.50 / gallon	\$2.00 / gallon
Haircut	2	\$10 / haircut	\$10 / haircut
Caffeine-free soda	100 cans	50¢ / can	60¢ / can
Zoo ticket	1	\$5 / ticket	\$5.50 / ticket

Value of the basket in 2004 is \$90.00

Value of the basket in 2005 is \$105.50

Inflation is, thus, 17.2% (% increase in value of the basket)

17. Using the data above, suppose that the nominal exchange rate in 2004 was \$1.20 / €. If the real exchange rate between Europe and the U.S. was 1.4, what was the cost of a European basket in 2004 measured in euro?

$$P = \$90, e=1.2 \text{ \& } q=1.4$$

$$q = eP^*/P \text{ or } P^* = qP/e = 1.4 \times 90 / 1.2 = 105$$

The price of European basket is €105.

18. Explain what the “Lucas critique” says about the conduct of fiscal and monetary policy.

The Lucas critique says that if policies can change, then agents in the economy will factor the possibility of those changes into their decision-making. Hence, if fiscal or monetary policymakers behave in predictable ways, in many cases, the effectiveness of their policies will be only slight. In order for policies to be effective, they must be unanticipated.

Section III (longer answers, 10 points each)

19. Explain how money is created by an open market operation.

An open market purchase of bonds by the central bank of $\$X$ increases checkable deposits (of the bond traders who sold to the central bank) and reserves of commercial banks at the central bank by $\$X$. (2 points)

With a fractional reserve system where a fraction, $rr < 1$, must be held to back up checkable deposits, this means commercial banks now have $\$(1-rr)X$ in excess reserves to loan out to the general public. (3 points)

Making these loans will increase holdings of currency and checkable deposits by the general public. As these deposits flow back into commercial banks they again find themselves with excess reserves (albeit not a much as before). (3 points)

This process is repeated again and again until the amount of excess reserves approaches zero. The money supply increases both because of increased holdings of cash by the public, but also by increases in checkable deposits. (2 points)

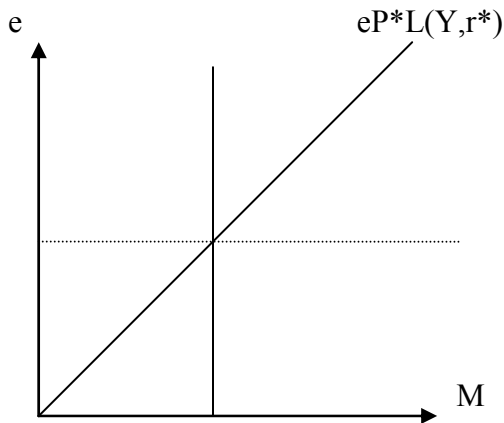
20. Explain why it is impossible to conduct independent monetary policy when a central bank pegs the exchange rate.

When a central bank pegs the value of its own currency to another currency it agrees to be the buyer and seller of last resort at the pegged value. If there is excess demand the bank will supply the foreign currency and if there is excess supply the bank will buy. (3 points)

If the bank were to increase the supply of the domestic currency, the relative abundance of this currency would make people value it less than the foreign currency to which it is pegged. At the fixed price set by the bank, this would lead to an excess demand for the foreign currency. (3 points)

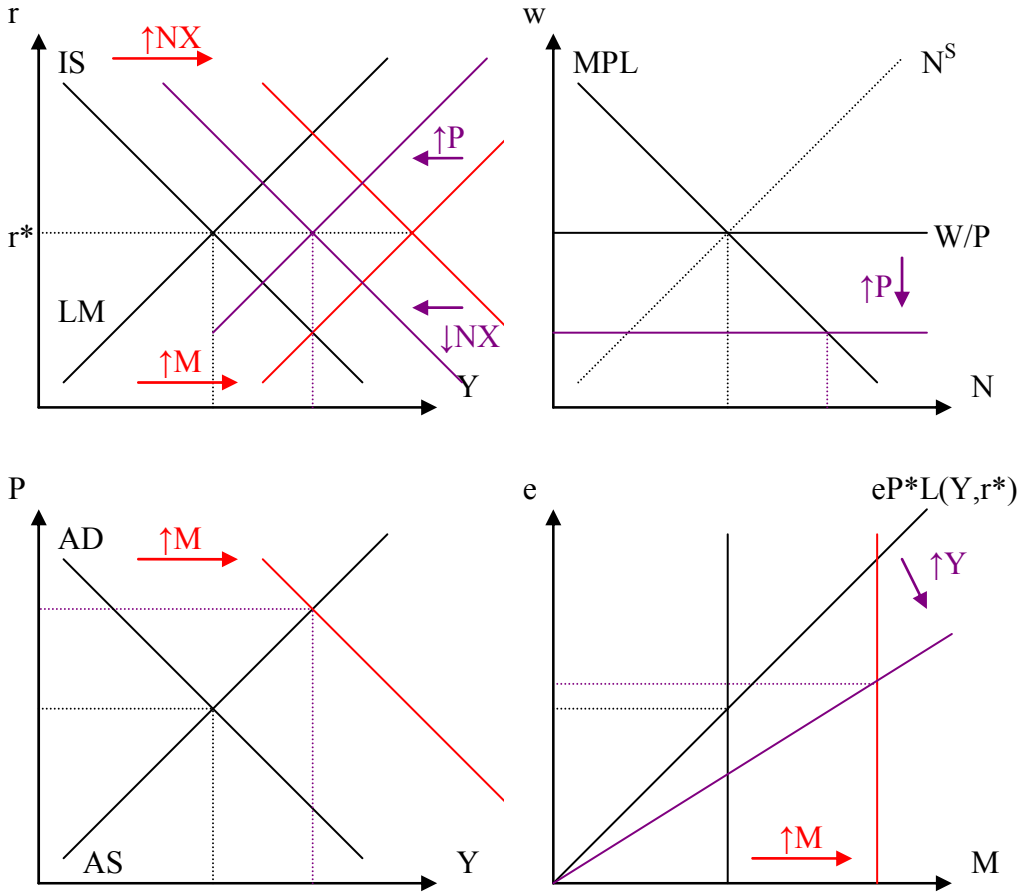
The central bank would then be forced to supply the foreign currency and buy its own currency, removing it from circulation. In the end, the central bank would be forced to buy back all the new currency it created leaving the money supply unchanged. (4 points)

Could also discuss this using the following graph, noting there is a unique value for the money supply consistent with the fixed value for the exchange rate:



Section IV (model analysis, 20 points)

21. Using the sticky wage setup and appropriate graphs, show the short-run response of real wages, employment, real interest rates, output, prices, net exports and the exchange rate to an unexpected increase in the money supply. Assume a flexible exchange rate regime and a small open economy. How would your answer differ if the increase in the money supply were perfectly anticipated?



An increase in the money supply would shift the LM curve to the right. Since we have a small open economy, net exports must rise to make sure that IS and LM intersect at the same interest rate as before (r^*). The net result shifts the AD curve to the right. As a result, output rises and so do prices. The increase in prices is not as large as the increase in the money supply, so the LM curve shifts back to the left as a result of the higher prices, but not all the way back to its original position. Again, net exports adjust to keep the intersection of IS and LM at r^* . The increase in prices, lowers the contracted real wage, which leads to more employment and output. Higher output increases the demand for real balances, but this leads to an ambiguous effect on the exchange rate.

In summary: $\downarrow w$, $\uparrow N$, r constant, $\uparrow Y$, $\uparrow P$, $\uparrow NX$, e ambiguous. (7 points direction, 7 points for explanation)

If the increase in the money supply was anticipated, then the contracted nominal wage would've been bid up prior to the increase and the AS curve would be shifted upward so that AS and the new AD curve intersected at the long-run level of Y . All real variables would've remained unchanged. Nominal values (P & e) would rise by the same amount as M did. (6 points)

Extra Credit (12 points)

22. Name the 12 regional federal reserve banks.

Boston

New York

Philadelphia

Cleveland

Richmond

Atlanta

Chicago

St. Louis

Minneapolis

Kansas City

Dallas

San Francisco