

**BOSTON COLLEGE**  
Department of Economics

EC 202 03  
Macroeconomic Theory  
Spring 2001  
Prof. Baum

MIDTERM EXAM ONE  
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Answer all questions. Total of **91** points. Partial credit will be given.

1. (21 pts) Consider the simple Keynesian model

$$\begin{aligned}C &= c_0 + c_1(Y - T) \\I &= \bar{I} \\G &= \bar{G} \\T &= T_0 + t_1Y \\Y &= C + I + G\end{aligned}$$

a. Derive the autonomous multiplier  $\frac{\partial Y}{\partial T_0}$ .

$$\frac{\partial Y}{\partial T_0} = \frac{-c_1}{(1 - c_1(1 - t_1))}$$

b. Demonstrate that equilibrium in the economy can be expressed in terms of savings equalling investment.

$C + S = Y + T$ , so  $S = Y - T - C$ .  $Y = C + I + G$ , so  $Y - T = C + I + G - T$ ,  
or

$Y - T - C = I + (G - T)$ , or  $S + (T - G) = I$ . Private saving + public saving  
= investment.

c. What is the effect on equilibrium income of a “balanced budget” fiscal policy, i.e.  $dG = dT_0$ ? Is the “balanced budget multiplier” equal to one, or larger, or smaller? Explain the economic rationale behind your answer..

This does not imply the budget is balanced; it implies that any change in  $G$  is matched by an equal change in  $T_0$ . Since  $\frac{\partial Y}{\partial G} = \frac{1}{(1 - c_1(1 - t_1))}$  and  $\frac{\partial Y}{\partial T_0} = \frac{-c_1}{(1 - c_1(1 - t_1))}$ ,  $\frac{\partial Y}{\partial Z} = \frac{1 - c_1}{(1 - c_1(1 - t_1))} < 1$  where  $dZ = dG = dT_0$  and  $0 < t_1 < 1$ . Since the higher

income induced by government spending leads to an increase in income taxes, the simple Keynesian model's  $BBM = 1$  does not apply here.

2. (15 pts) Consider a macroeconomy in which all financial wealth consists of holdings of money and bonds.

a. Explain how an increase in the money supply disrupts financial market equilibrium, and how that equilibrium will be reestablished.

An increase in  $M$  will be carried out by buying bonds from the public, bidding up bond prices and depressing their yields (the interest rate). The public must be induced to hold the additional money by a lower opportunity cost (interest rate). Financial market equilibrium exists at every point on the LM curve.

b. Explain why contractionary monetary policy may have more predictable effects than expansionary monetary policy.

“Pushing on a string”—the Fed can inject reserves (high-powered money) in the banking system, but they can't make banks lend, nor necessarily improve investors' sentiments about the health of the real economy. But contractionary policy removes reserves, forcing banks to adjust by contracting their deposits.

c. In the real world, savers purchase stocks (equities) as well as bonds. Equities have, over the long term, yielded several percent higher returns than those on government bond. Why do savers persist in holding bonds if their performance is dominated by that of equities?

Bonds and equities coexist in savers' portfolios even though equities have higher expected returns because equity returns include a “risk premium” compensating savers. The risk-adjusted return may be equal to that on bonds, given the much greater volatility in equity markets.

3. (30 pts) Indicate clearly whether each of the following statements is TRUE or FALSE, and EXPLAIN your answer. No credit for merely asserting T or F.

a. The trend toward a greater proportion of U.S. GDP in services, rather than goods, may explain the decline in productivity over the last decade.

T: GNP growth and (total factor) productivity have both slumped. Productivity in service sectors (like higher ed!) has not increased as fast as productivity in goods sectors. A trend toward greater services is thus implicated for the overall decline.

b. Investment in capital goods is much less sensitive to economic conditions than is spending on consumer goods.

F: Investment is derived demand, whereas consumer spending is smoothed by life-cycle consumers and the presence of necessities in consumption.

c. Open market operations, which finance the government's deficit spending, inject new money into the economy, thus increasing the private sector's wealth.

F: OMOs do not finance deficit spending, they do not involve the creation of “new money,” and they do not increase nor decrease wealth; they merely alter the composition of the public’s wealth, trading money for bonds or v.v.

d. When we take the “LM” curve into account, the government spending multiplier is smaller than its equivalent in a “simple Keynesian” model.

T: In the ISLM framework, the simple Keynesian model corresponds to a horizontal LM curve. As the LM curve steepens,  $\frac{\partial Y}{\partial G}$  becomes smaller than it would be in the simple Keynesian model. Do the math!

e. In the IS-LM framework, a tax increase leads to a decrease in the interest rate unless the Fed accommodates by increasing the money supply.

F: A tax increase shifts IS left, reducing  $Y$  and  $r$ , but an increase in  $M$  would reduce  $r$  even more.

f. Deflation may be a greater threat to prosperity of the macroeconomy than single-digit inflation.

T: Deflation will have more specific effects (e.g. on debtors), whereas low inflation will have much more general effects on economic agents.

4. (25 pts) The aggregate demand and aggregate supply relations are:

$$P = P^e (1 + \mu) F \left( 1 - \frac{Y}{L}, z \right)$$
$$Y = Y \left( \frac{M}{P}, G, T \right)$$

Show graphically, and explain the economic rationale for the effects on equilibrium of:

a. A decrease in the unemployment rate

A decrease in unemployment (or increase in employment) implies  $\frac{Y}{L}$  is rising, perhaps due to a decrease in  $L$ . This shifts  $AS$  to the left. Since it does not affect any component of autonomous spending, it does not shift the  $AD$  curve.

b. An increase in the female labor participation rate

Similarly, this increases  $L$  and places downward pressure on wages, shifting  $AS$  to the right, while not affecting any component of  $AD$ .

c. An increase in the nominal money supply

This is a pure demand-side effect, shifting  $AD$  to the right. It has no short-run effects on  $AS$ .

d. An increased degree of competitiveness resulting from vigorous antitrust enforcement

This is a pure supply-side effect. Reducing  $\mu$ , the wedge between wages and prices, shifts  $AS$  to the right.

e. Dubya's \$1.6 trillion tax cut

Like (c), this is a pure demand-side effect, shifting  $AD$  to the right. It has no short-run effects on  $AS$ .