

# Problem Set 3 Answer Key

Economics 115, Fall '09

October 18, 2009

## 1

We are given that  $Y$  = output

AD = aggregate demand

C = consumption

I = investment

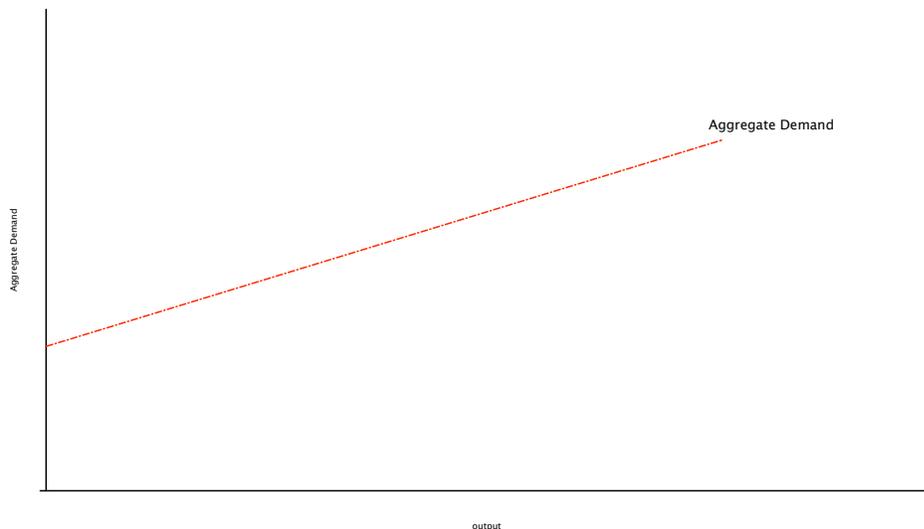
G = government spending

T = net taxes = taxes - transfers

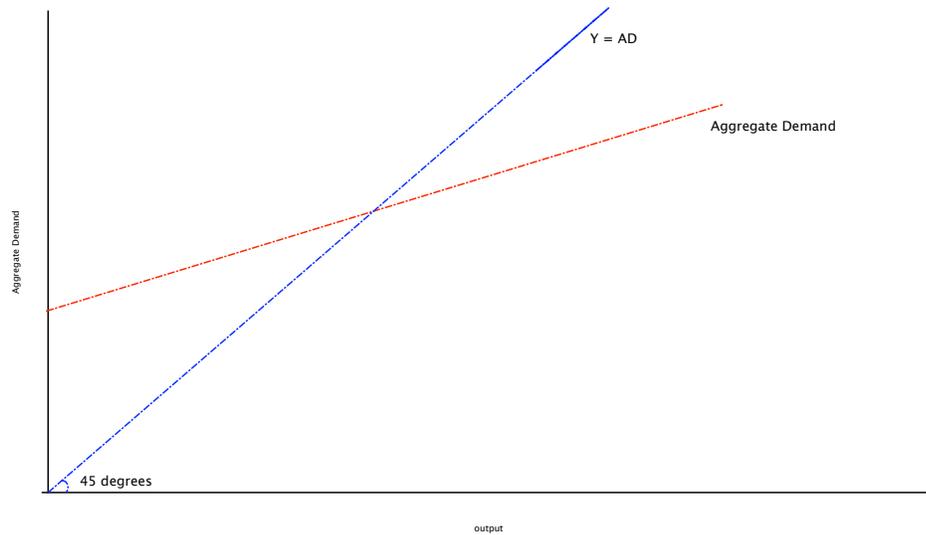
- a If  $b$  were 0, people would consume no more when their income rises. This is implausible. If  $b$  were 1, people would save no more when their income rises; this is also implausible. This logic implies that  $b$  must lie between 0 and 1.
- b Substituting, one obtains

$$AD = a + b(Y - T) + I_0 + G_0. \quad (1)$$

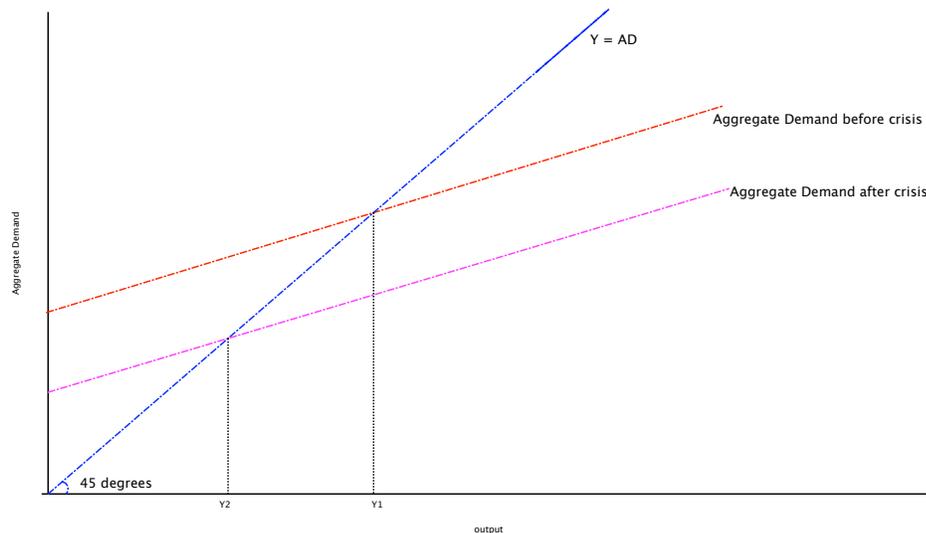
The slope of the aggregate demand curve is  $b$ . Thus from part (a) we know that the slope is between 0 and 1. Note that the y-intercept must be greater than 0 since  $a + I_0 + G_0 > 0$ .



c The condition  $Y = AD$  corresponds to the 45 degree line.



d The fall in investment reduces  $I_0$ , shifting the AD curve down. The fall in consumption can be modeled as a fall in 'a', which corresponds to a downward shift of the AD curve (shown in the graph below). It was also fine to think of this as a decrease in 'b' (the marginal propensity to consume), which would flatten the AD curve. Either way, the decline in consumption reinforces the decline in aggregate demand and output due to the investment collapse.



e The government can increase output by shifting the AD curve up through either an increase in government spending or a decrease in taxes.

f As Fearon describes, there was relatively little fiscal policy during the Great Depression. FDR increased government spending (G), but also increased taxes (T).

g Yes, the stimulus bill is fiscal policy. It both increased government spending and reduced taxes.

h Many different answers possible . . .

## 2

a As interest rates rise, it becomes more expensive for firms to borrow in order to invest. Even if a firm has cash on hand, it faces the choice between putting the cash in the bank or investing (buying a new machine, building a new factory, etc.). The higher the interest rate, the more attractive it is for the firm to leave its money in the bank rather than invest in new equipment.

b An increase in the interest rate will decrease investment, shifting the aggregate demand curve down, and thus lowering output.

## 3

a  $f$  ought to be negative. The higher the interest rate, the more expensive it is for me to have cash in my wallet where it does not earn interest. You can think of the interest rate as the price of holding money. As the price of holding money goes up, people demand less money.

b An increase in the money supply will decrease the interest rate. In order to induce people to hold more money, the interest rate must fall. This is the same logic that applies to any market - if the supply of apples increases, the price of apples will fall.

c An increase in the money supply will decrease interest rates, thus increasing investment. This shifts the aggregate demand curve up, which increases output.

d Yes, the above logic assumes that an increase in the money supply decreases interest rates. But (nominal) interest rates cannot fall below zero. Thus if the money supply increases when interest rates are already at zero, the increase in the money supply will not lower interest rates. Hence it will not affect investment, aggregate demand, or output.

## 4

a Since money demand falls when the interest rate rises, velocity must rise when the interest rate rises.

b By raising interest rates fiscal policy will increase velocity. Holding the money supply fixed, this will increase  $p * q$ .

- c Economists usually favor using monetary policy rather than fiscal policy when possible. It is much easier for the Federal Reserve to quickly implement monetary policy than it is for congress to quickly implement fiscal policy. But Part 3d suggests that monetary policy will not be effective when interest rates are 0. In this case, fiscal policy may be the only way the government can prevent low output and high unemployment.