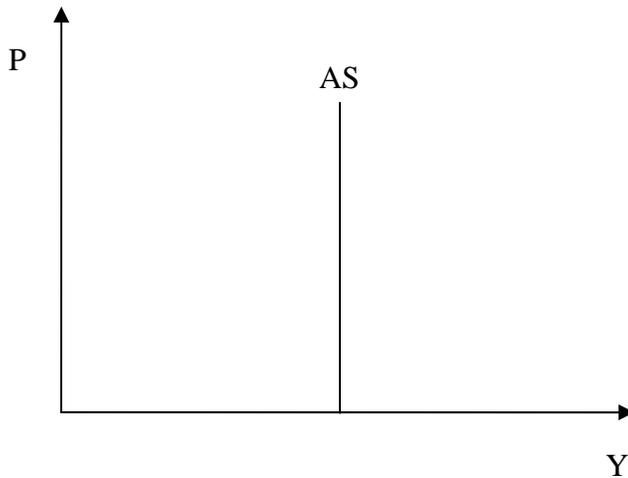


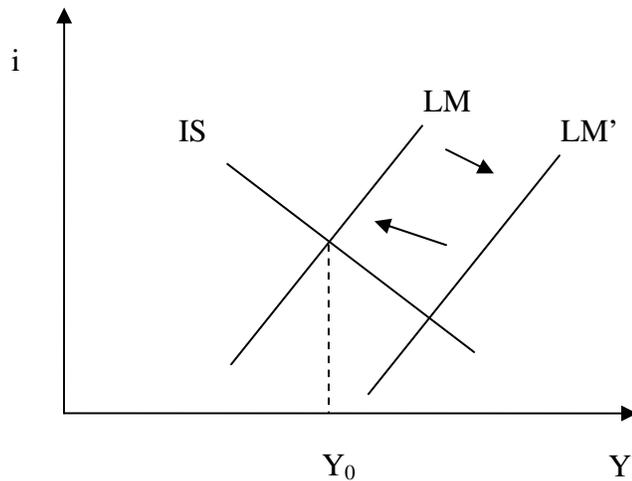
Question 1

Problem 2 on page 482 of Williamson

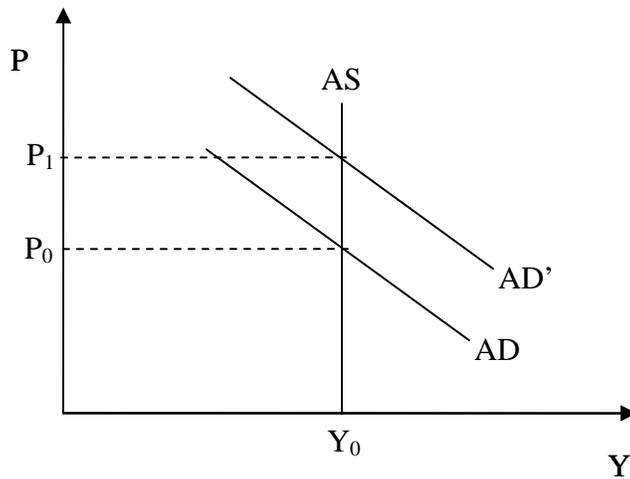
- a) When the real wage is fixed, an increase in prices has no impact on labor demand or production. When prices rise by x , wages rise by x as well. Therefore, labor becomes no more expensive or cheaper for firms so their preferred level of employment remains unchanged. In this case, the aggregate supply curve is vertical.



- b) If the money supply increases, the LM curve shifts out initially:

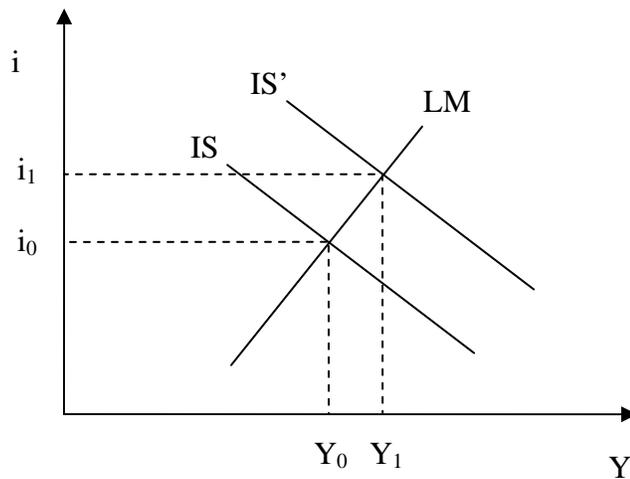


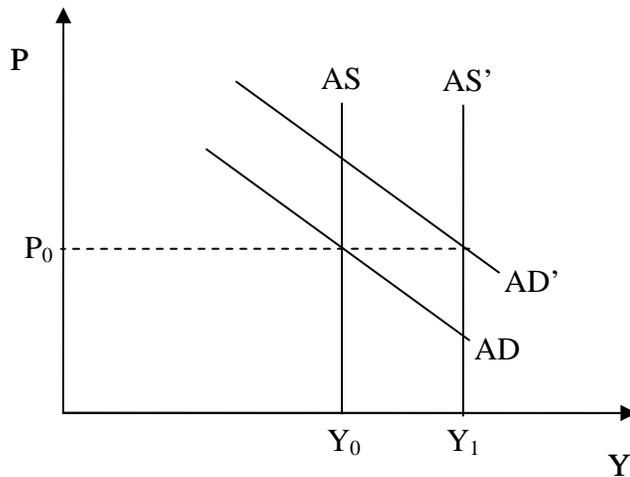
Interest rates tend to drop and investment demand increases. The aggregate demand curve shifts right as a result:



From this, we see that output stays fixed at Y_0 due to the fixed real wage. How does this happen? The increase in prices to P_1 causes the LM curve to shift back from LM' to LM . So, real output doesn't change, employment doesn't change (the real wage is fixed) the real interest rate is fixed, the real wage is fixed, the nominal wage is higher, and Keynesian unemployment is unchanged as well.

- c) Now, we will see that the IS curve shifts right (with higher productivity, firms demand more investment goods). In addition, both the AD and AS curves shift right: AD because there is more investment while AS because productivity is higher at a given price. Graphically:





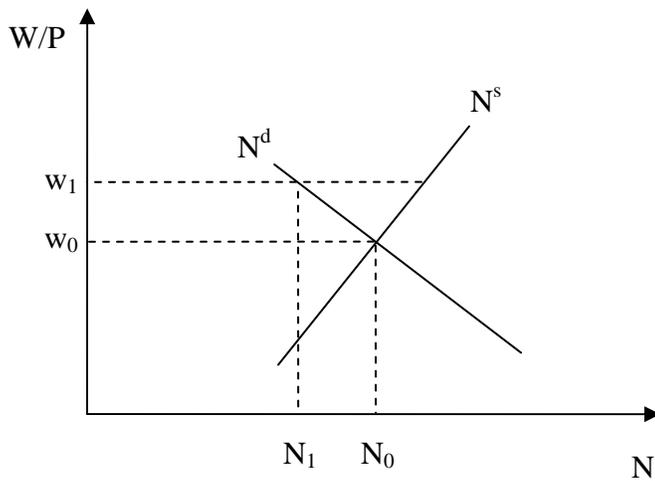
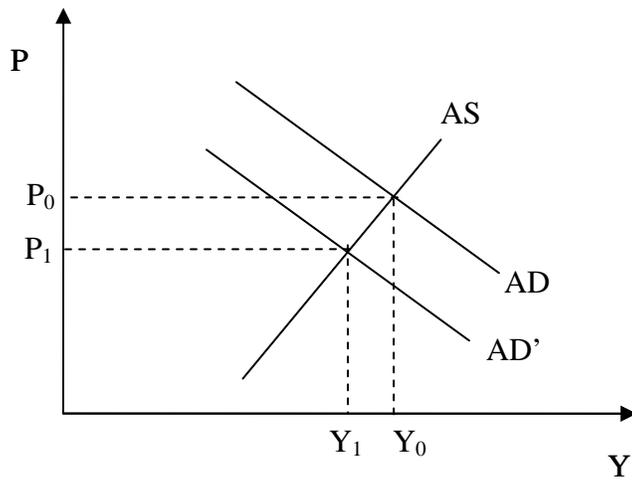
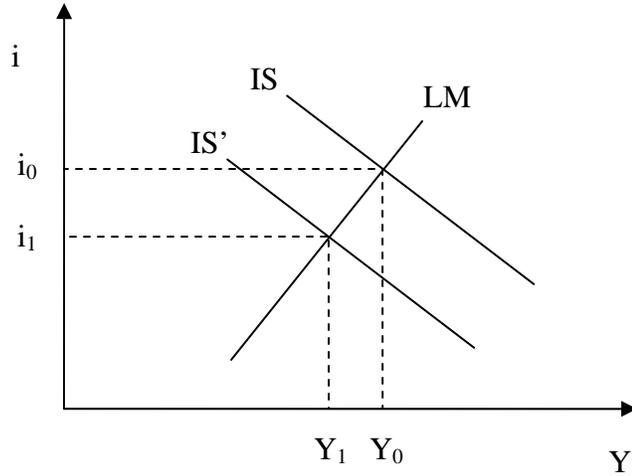
As the IS curve moves to IS', interest rates rise and output increases. As the AS curve shifts to AS' and aggregate demand shifts to AD', prices remain constant. The real wage will remain fixed and unemployment will stay the same since the boom in output is due to productivity (you might argue that the labor demand curve would shift right, leading to higher employment).

The main difference between parts a) and b) is that output has actually increased without inflation in response to the productivity shock. In part b) money was "neutral" (it had no impact on production or employment)

Question 2

Problem 4 on page 483 of Williamson

a) In this case, we have the following graphs:



The lower level of investment implies that the IS curve shifts down to IS' while the aggregate demand curve shifts down to AD'.

We find that there is a decrease in interest rates (to i_1), output (to Y_1), and the price level (to P_1). The real wage increases to w_1 (because prices are lower). This causes employment to fall to N_1 .

- b) If monetary policy is used to counteract the drop in investment, the money supply is increased. This will shift the LM curve right above. Interest rates will drop further, prices will recover and rise (because AD moves right), output will increase, the real wage will fall (there are higher prices), and employment will rise. Note that the rise in prices will weaken the recovery of the economy because the LM curve will partially shift back to its initial position.
- c) In this case, the IS curve will shift right. All of the same things happen as when the money supply expands. The only difference is that interest rates rise, rather than fall.
- d) When policy is used to offset the drop in investment, the economy can enter a more shallow recession (or avoid a recession entirely). The main difference between employing monetary, versus fiscal, policy to correct the path of the economy is that a fiscal policy response entails higher interest rates. This tends to reduce investment and, potentially, the long-run performance of the economy.

Question 3

For this question, use the correlogram below for the United States to describe if each variable moves procyclically or countercyclically and whether the variable is leading or lagging:

i	Consumption Growth		i	Money Growth	
	lead	lag		lead	lag
0	0.572	0.572	0	0.0688	0.0688
1	0.2057	0.3465	1	-0.0581	0.1114
2	0.1212	0.2131	2	-0.0952	0.1288
3	-0.1395	0.0573	3	-0.1154	-0.0095
4	-0.0924	0.0668	4	-0.1128	0.0264
5	-0.1887	-0.0884	5	-0.0557	-0.0816
6	-0.0564	-0.0787	6	-0.1636	-0.0446
7	-0.0556	-0.0245	7	0.0026	-0.0785
8	-0.0057	-0.1161	8	-0.0545	-0.0598
9	0.1514	0.0425	9	0.0197	-0.0273
10	0.0331	0.0002	10	-0.0036	-0.1057

From this data, consumption growth is contemporaneously procyclical (we can see this by the correlation coefficient of 0.572 when $i=0$). Money growth moves

procyclically and leads the cycle (we can see this from the correlation of .13 with a lag of $i = 2$).