Professor Christiano
311, Spring 2000

Notes for TA's on Answers to Second Midterm

1. Suppose there is an improvement in a country's unemployment insurance system.

   (a) Absent any change in the markup of prices over marginal costs, the change in the unemployment insurance system cannot produce a change in the real wage. The only way to get an equilibrium in the bargaining model, when the workers' bargaining position improves, but the real wage does not change, is for something else to happen to reduce the workers' bargaining power. That something else is the unemployment rate. The improved unemployment insurance system would, in the model developed in this course, result in a higher natural rate of unemployment. It would be sufficiently higher so that the change in the unemployment system would have no net effect on the bargaining power of the worker. This can be seen by appropriately the wage setting curve in the bargaining model.

   (b) Our price setting equation specifies that $P = (1+\mu)W$. Breaking up monopoly power would have the effect of reducing μ, and therefore raising the real wage, W/P. If this is done at the same time as the overhaul of the unemployment insurance system, then it is possible for the natural rate not to change at all.

   (a) The shock shifts up the AS curve. At the original equilibrium, prices are not set the way firms want them. They are too low. So, the price level starts to rise. This occurs slowly, because many prices are set by contract, and those contracts do not come up for renegotiation right away. As soon as the price level starts to rise towards the new AS curve, the economy is off the AD curve. You can see what happened in the IS-LM diagram. The rise in the price level has increased money demand, shifting the LM curve to the left and up. We assume that the interest rate always moves to instantly clear the money market. So, with the LM curve shifting up, the interest rate jumps up. The higher interest rate puts the economy above the IS curve, where aggregate demand is less than output. With the resulting pile-up of inventories, output begins to fall, slowly. In the AD-AS diagram, the price level is rising and output is falling. We assume these two adjustments occur slowly, so we can suppose that the economy simply shifts up the AD curve (its position does not change). This process continues until the economy reaches the intersection of the AD curve and the new AS curve. This corresponds to a point in the IS-LM diagram that is up and to the left along the unchanged IS curve, where it intersects with a higher LM curve.

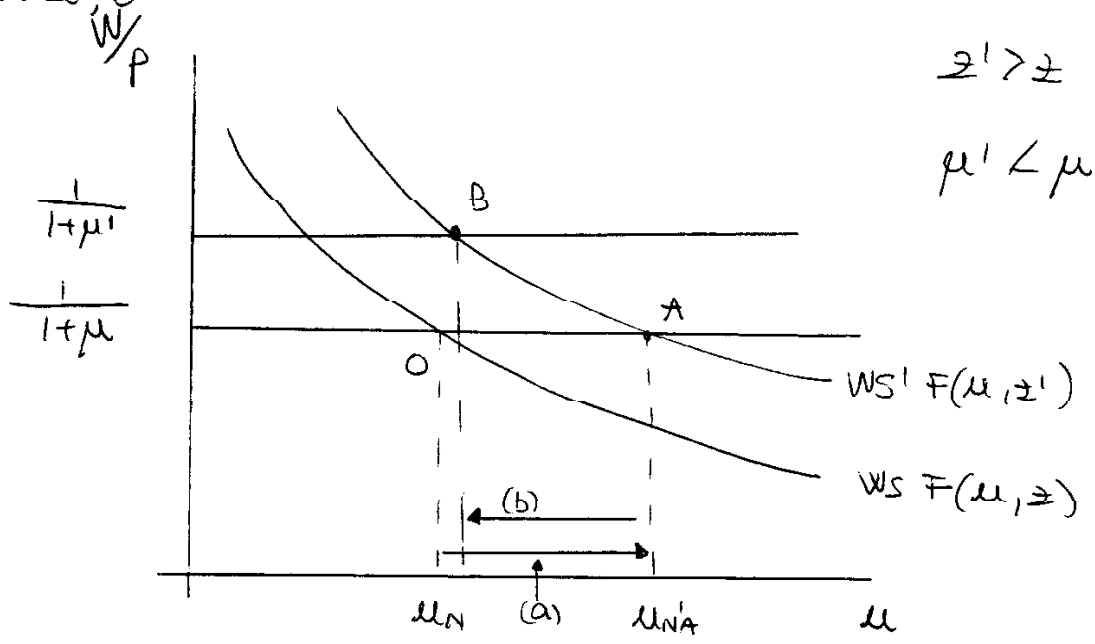
Since P is now higher than P^e, P^e starts to increase. This shifts the AS curve even further to the left, until a new, medium run equilibrium is reached in the AS-AD diagram when the AS curve intersects with the AD curve at the lower natural rate of unemployment. The natural rate of unemployment is now lower because the real wage has been reduced by the higher μ, and a higher unemployment rate is needed for this lower real wage to be an equilibrium in the bargaining model.

(b) As explained above, the natural rate of unemployment falls with the shock. Also, it is easy to see geometrically that the actual unemployment rate does not fall all the way to the new natural rate in the short run. As a result, to get the economy to the new natural rate in the short run, the monetary authority has to adopt a contractionary monetary policy. When the monetary authority decreases the money supply, the interest rate increases instantly to clear the money market. In the IS-LM diagram, this corresponds to the LM shifting up. In the AS-AD diagram, it corresponds to the AD shifting down. At the medium run equilibrium, prices are lower than they would have been without the contractionary monetary policy.

2. Consider a negative shock to c_0. In the Keynesian cross model, where both i and P were held fixed, a drop in c_0 produces a fall of $\Delta c_0/(1-c_1)$ in output. When we allow i to be flexible, as in the IS-LM model, then the fall in output is accompanied by a fall in the interest rate, which stimulates investment. The rise in investment partially offsets the negative effects on aggregate demand of the drop in c_0, and so prevents output from falling so much. This can be seen in the IS-LM diagram, where the Keynesian Cross and the IS-LM multipliers can be compared directly. Now, when we allow P to change, more happens. With flexible P, the price level falls with the fall in output because of the reduced pressure on productive resources (essentially, labor). This fall in P has the effect of shifting the LM curve to the right as it reduces money demand and allows a drop in the interest rate. This drop in the interest rate further stimulates investment, adding one more factor cushioning the negative impact on aggregate demand of the drop in c_0. That flexible prices cushion things more can be seen geometrically in the AD-AS diagram where it is easy to see the IS-LM multiplier and the AD-AS multiplier.

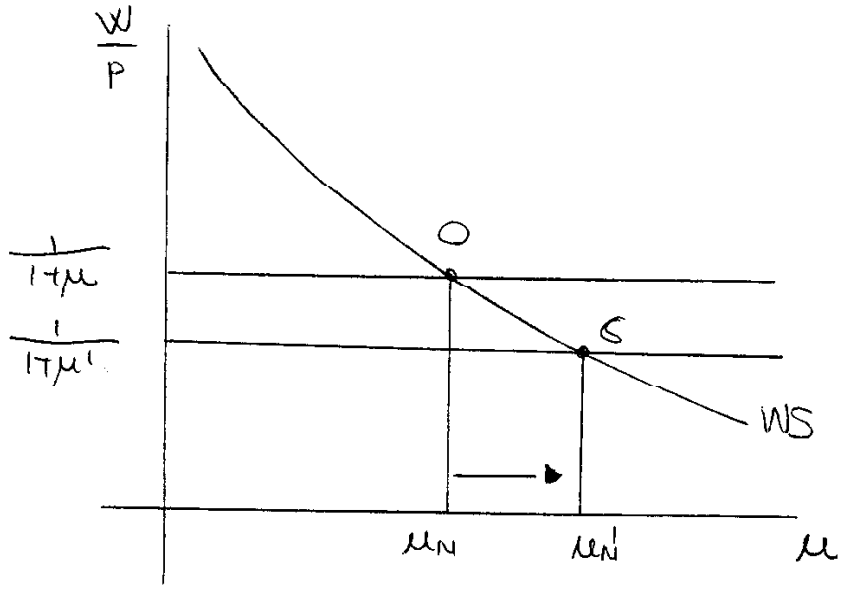
3. A rise in P^e shifts up the AS curve. If the Fed does nothing, output goes through a temporary period of recession. When people realize that P^e exceeds P, then P^e falls again and we go back to the original place. The Fed could prevent the period of recession by increasing AD to the point where P equals the now higher P^e.

1. a, b



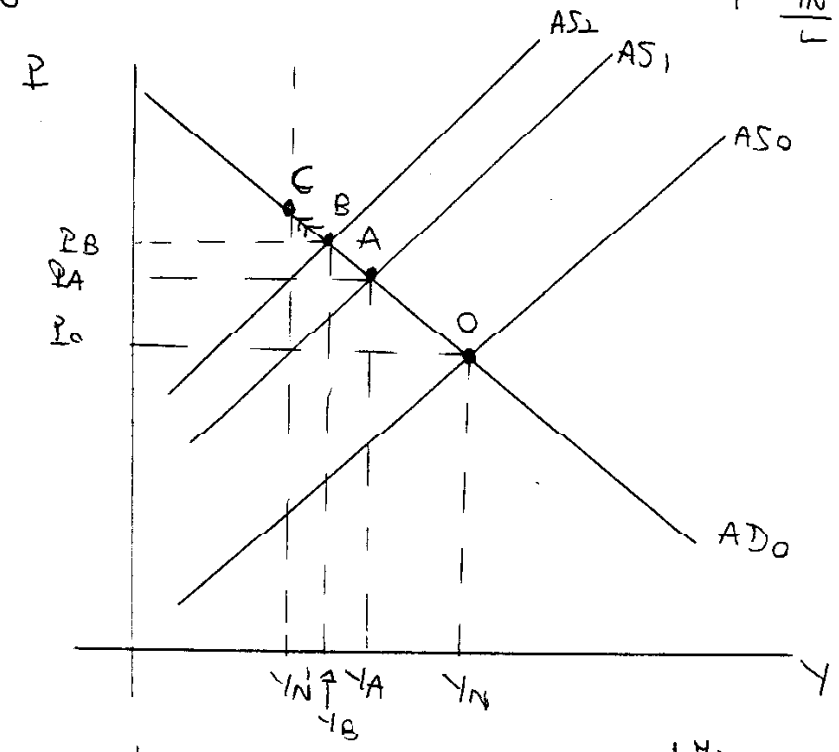
2. a

EFFECT ON EMPLOYMENT IN MEDIUM RUN



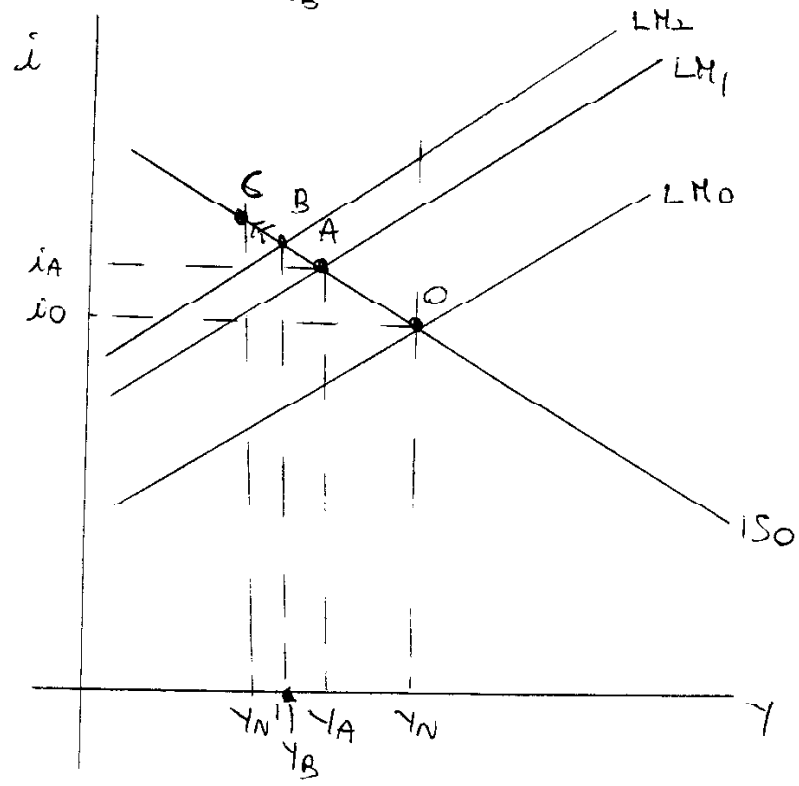
2.a

$1 - \frac{Y_N'}{L} = u_N'$

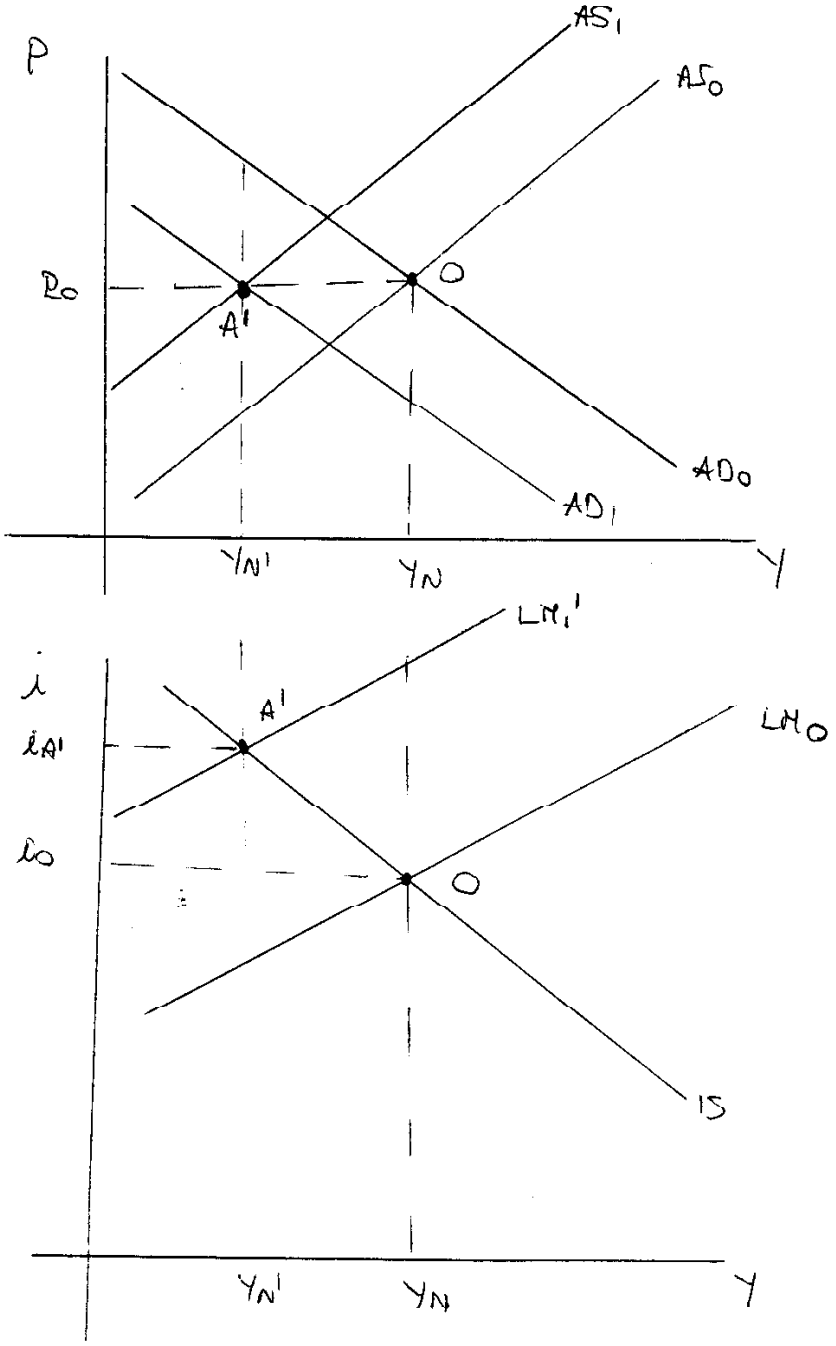


A ≡ SHORT RUN EQUILIBRIUM

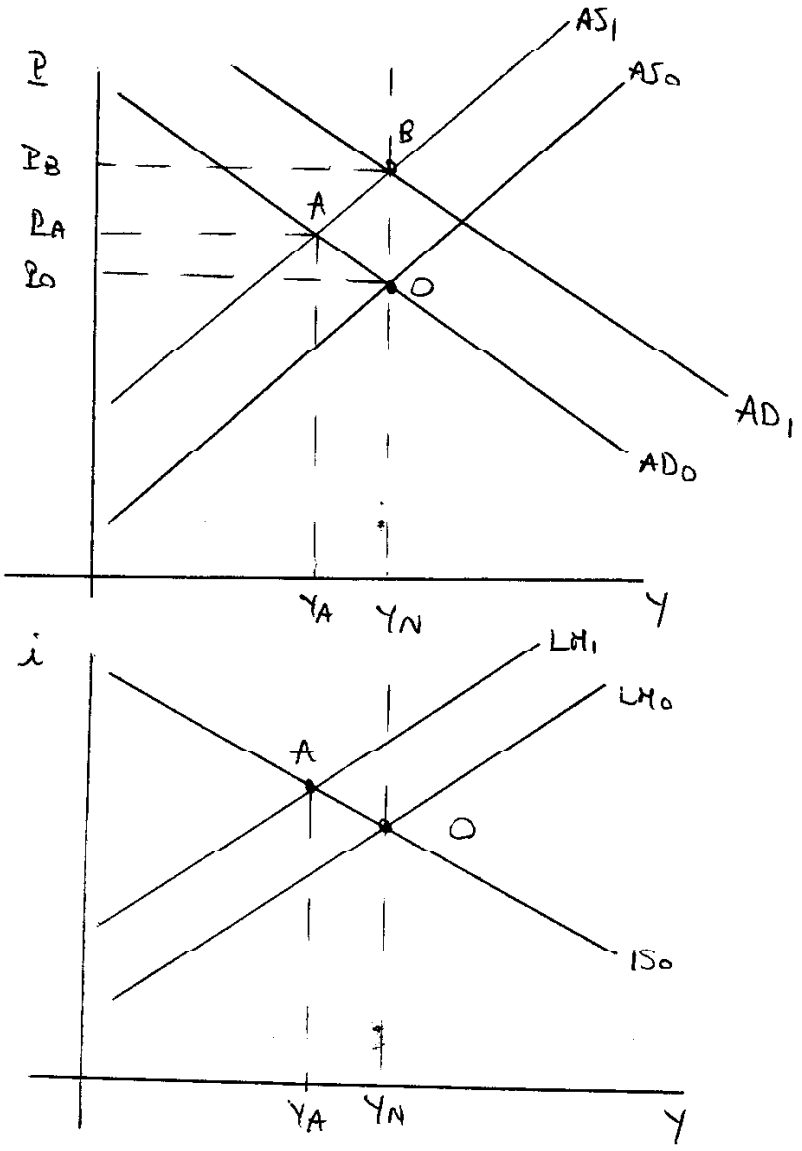
C ≡ MEDIUM RUN EQUILIBRIUM



2.b THE MONETARY AUTHORITY CAN USE CONTRACTIONARY MONETARY POLICY TO BRING THE ECONOMY TO C IN THE SHORT RUN.



4.



A ≡ SHORT RUN EQUILIBRIUM AFTER AN EXOGENOUS INCREASE IN P^e

The Fed might increase money supply to prevent fall in output. This shifts LM from LM_1 to LM_0 and the AD to AD_1.

Equilibrium is at point B : $P_B > P_A$