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ECO 209Y
MACROECONOMIC THEORY

Solution to Problem Set 15
(Odd numbers only)

1. a) In order to keep the economy always at full employment, the Bank of Canada must implement contractionary monetary policy every time a situation of excess demand develops and expansionary monetary policy every time a situation of excess supply develops. If the Bank of Canada implements countercyclical monetary policy as a result of a demand shock to the economy, both π and *Y* will remain unchanged. However, if the Bank of Canada implements countercyclical monetary policy as a result of a supply shock to the economy, then *Y* will remain unchanged but π will either increase further if the supply shock is negative or decrease further if the supply shock is positive.

   b) When the economy is above full-employment, π increases. In turn, if expectations are backward-looking, a higher π will trigger higher expectations of inflation and put further upward pressure on nominal wages. Therefore, the *AS* curve will shift up. If the Bank of Canada doesn't want *Y* to decrease towards *Y**, it must implement expansionary monetary policy and the *AD* curve will shift up. In this way, *Y* will be kept above *Y**, but π will increase further. This process will continue period after period as long as the Bank of Canada maintains the objective of keeping the rate of unemployment 1 percentage point below *u**. Therefore, in this situation the rate of inflation will increase over time.

   c) When the economy is below full-employment, π decreases. In turn, if expectations are backward-looking, a lower π will trigger expectations of *deflation* and put further downward pressure on nominal wages. Therefore, the *AS* curve will shift down. If the Bank of Canada doesn't want *Y* to increase towards *Y**, it must implement contractionary monetary policy and the *AD* curve will shift down. In this way, *Y* will be kept below *Y**, but π will decrease further. This process will continue period after period as long as the Bank of Canada maintains the objective of keeping the rate of unemployment 1 percentage point above *u**. Therefore, in this situation the rate of *deflation* will increase over time.

3. The increase in oil prices increases the cost of production of almost every good and service produced in the economy. Therefore, firms will demand a higher price for their product to cover this increase in cost. In our model we assume that firms set their prices as a constant mark-up over their unit labour cost, where the mark-up is sufficient to cover all non-labour costs of production other plus the normal profit of the firm. Since the price of a non-labour cost has increased, unit labour costs (at each level of Y) do not change but the constant mark-up increases in the short-run. Therefore, the AS curve shifts up to AS_1 and the economy moves into a situation of stagflation — output dropping to Y_1 and inflation increasing to π_1.

   Note that the actual rate of inflation in the new short-run equilibrium (π_1) is smaller than the contribution made by the increase in the price of oil to inflation (π_1'). This is so because the economy has moved into recession — output falling below potential output and the rate of unemployment rising above the natural rate.

   In the next period, workers adjust their willingness to supply labour according to their expectations of inflation (π_1). Therefore, in period 2, the AS curve shifts down to AS_2 and equilibrium output increases to Y_2 (not shown in the diagram) and the rate of inflation falls to π_2 (not shown in the diagram). Note

that, since firms are hiring more labour, the model suggests that real wages are falling, i.e., the rate of inflation (π) is greater than the rate of growth of money wages (g_W).

This process continues period after period until a new long-run equilibrium is achieved, where the level of output and the rate of inflation are equal to their original equilibrium values before the increase in the price of oil. Therefore, in the long run average prices catch up with the increase in the price of oil, but real wages are lower than in the initial long-run equilibrium. The model thus suggests that the cost of the adjustment to the increase in the price of oil falls entirely on the back of workers through a decrease in real wages.