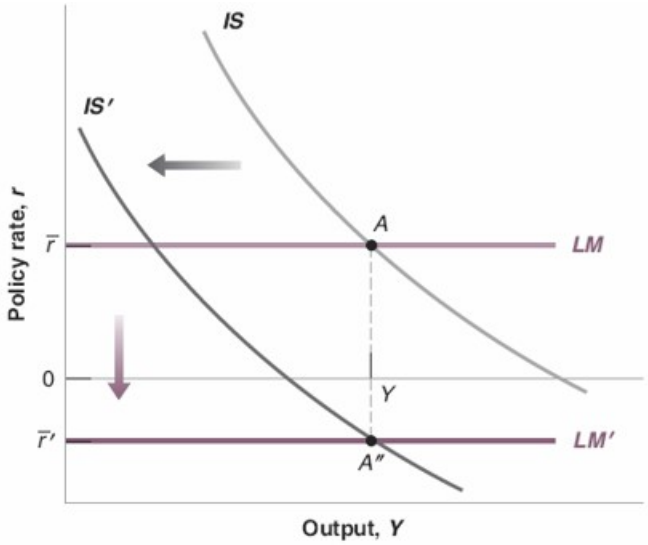
Nanyang Technological University
School of Social Sciences

HE2002 Macroeconomics II AY23-24 SEMESTER 2

Solution to Tutorial 5

1. **Chapter 6, Q5. The IS-LM view of the world with more complex financial markets**

Consider an economy described by the Figure below.



(a) It is the real interest rate or the real policy rate.

(b) That value is 2% ($r = i - \pi^e = 5\% - 3\% = 2\%$). The real interest rate is 2%

(c) The central bank would have to lower the nominal policy interest rate by 1% accordingly.

(d) No, the position of the IS curve depends on the real borrowing interest rate. Expected inflation does change that rate since expected inflation is part of the definition of a real interest rate. (IS relation: $Y = C(Y - T) + I(Y, r + x) + G$)

(e) No, the position of the LM curve is defined by the real policy rate of interest. A change in expected inflation does not, in itself, shift that curve. The central bank is taking expected inflation into account in setting a real policy rate of interest. (Zero lower bound on nominal policy rate is not reached here, thus it does not affect the position of LM curve. If zero lower bound on nominal policy rate is reached, the real interest rate should be the negative of expected inflation rate, changes in expected inflation rate would affect the real interest rate, and the position of LM curve.)

(f) No, the risk premium does not shift the LM curve. It is horizontal at the real policy rate of interest which does not incorporate the risk premium. (LM relation: $r = \bar{r}$)

(g) Yes. At the same real policy rate of interest, the real borrowing rate of interest rises. There is less investment and the IS curve shifts left (or down).

(h) If the increase in the risk premium causes the IS curve to shift to the left, a tax decrease or an increase in government spending could be used to shift the IS curve back to the right by the same amount. The level of output would not change.

(i) The central bank could reduce the real interest rate so the LM curve shifts down.

2. **Chapter 6, Q9. Unconventional monetary policy: financial policy and quantitative easing**

We have written the IS-LM model in the following terms:
IS relation:

$$Y = C(Y - T) + I(Y, r + x) + G$$

LM relation:

$$r = \bar{r}$$

Interpret the real policy rate as the federal funds rate adjusted for expected inflation. Assume that the rate at which firms can borrow is much higher than the federal funds rate, equivalently that the premium, x, in the IS equation is high.

(a) The risk premium is likely to fall. The IS curve will shift to the right. This will increase output and can be thought of as a sort of macroeconomic policy.

(b) The risk premium is likely to fall. The IS curve would shift right and output would increase. Quantitative easing becomes a policy option when the nominal policy interest rate (the federal funds rate) is zero.

(c) Strictly speaking, the increase in expected inflation does not directly affect the level of the real policy rate except when the nominal policy rate remains constant. In Figure 6-9, this is the exact situation. The nominal policy rate of interest is zero and the real policy rate of interest is the negative of the expected inflation rate. Thus, if an action by the Fed increases expected inflation, this would decrease the real policy interest rate and shift the LM curve down. You would move ALONG the IS curve and output would rise.