



STUDY MATERIAL

VIVEKANANDA COLLEGE
THAKURPUKUR
NAAC ACCREDITED GRADE—'A'

18/05/2018
Thakurpukur

© Vivekananda College

Subject: Economics
Topic: Phillips Curve(Part-2)

By

Isita Mukherjee

Department of Economics

Inflation and Interest Rates

- The Neo-Keynesians went to some great efforts to incorporate inflation into their world, and they duly believed that much was gained in terms of closing their model and engendering new policy perspectives. But the next question seemed to be a more pertinent one: what are the implications of inflation on the workings of the rest of the model?
- In fact, not many. The only thing highlighted by the introduction of inflation was the effect on interest rates as outlined by Robert Mundell (1963) and Roy Harrod (1969). Mundell tackled the old Fisherian law on the constancy of the real rate of interest, i.e. where $r = i - \pi$ - where if inflation (π) rises, then nominal interest rate (i) will rise one-for-one to keep real interest rates (r) constant. Keynes (1936), of course, disputed Fisher's assertion and Fisher (1930) himself was reluctant to make too much out of it empirically. Mundell (1963) advanced on them both by proving that it was invalid in an IS-LM type of model.
- Mundell's reasoning was as follows: the nominal rate of interest is set by inflation expectations and the real interest rate, $i = r + \pi^e$. Now, suppose we have two assets, money and bond, where r is the real return on bond. By Keynes's theory of liquidity preference, money demand is inversely related to the return on alternative assets, i.e. $L(r, Y)$. We know, of course, that in equilibrium $M/p = L(r, Y)$, as money supply rises, the rate of interest falls, so we can trace out an money market (MM) equilibrium locus in interest/money supply space as in Figure 2. Now, a particular MM curve is conditional on a particular level of inflationary expectations (π^e). If inflationary expectations rise, then, for any given amount of money supply, the real interest rate, $r = i - \pi^e$, falls and thus the MM curve shifts down.

- The intuitive logic is that we must remember that the *negative* of inflation is the real rate of return on money. Thus, if there are inflationary expectations, agents who hold money are receiving a negative expected return on their real balances and thus will attempt to get rid of them by purchasing bond. As a result, money demand falls and the price of bond rises - and consequently the real rate of return on bond, r , falls. In Figure 2, we denote by $MM(\pi^e=0)$ the money market equilibrium locus where there are no inflationary expectations and $MM(\pi^e > 0)$ as the money market equilibrium locus when there is a particular positive expected inflation rate.
- However, recall also from simple analysis, that real interest rates impact the goods market as well. Making use of some Neo-Keynesian transmission mechanisms, as r rises, consumption falls and investment falls. Furthermore, recall that by a Pigou Effect, a rise in money supply increases net wealth and hence consumption. Thus, consumption can be summarized by $C = C(r, Y, V)$ where $C_r < 0$, $C_Y > 0$ and $C_V > 0$. The term V is aggregate net wealth, here defined as $V = B + M/p$ (where B is bond and M/p the real money supply). Investment is $I = I(r)$ where $I_r < 0$ by the marginal efficiency of investment story. In goods market equilibrium, aggregate demand equals aggregate supply, so $Y = Y^d = C(r, Y, V) + I(r)$. Thus, we can draw out a YY curve which denotes the relationship between money supply M/p and interest. Specifically, note that as r rises, investment and consumption falls, so in order to keep the *same* level of output, then, money supply must rise. Thus, the YY equilibrium locus (which is for a *given* level of output) is upward sloping in money supply-interest rate space, as shown in Figure 2.

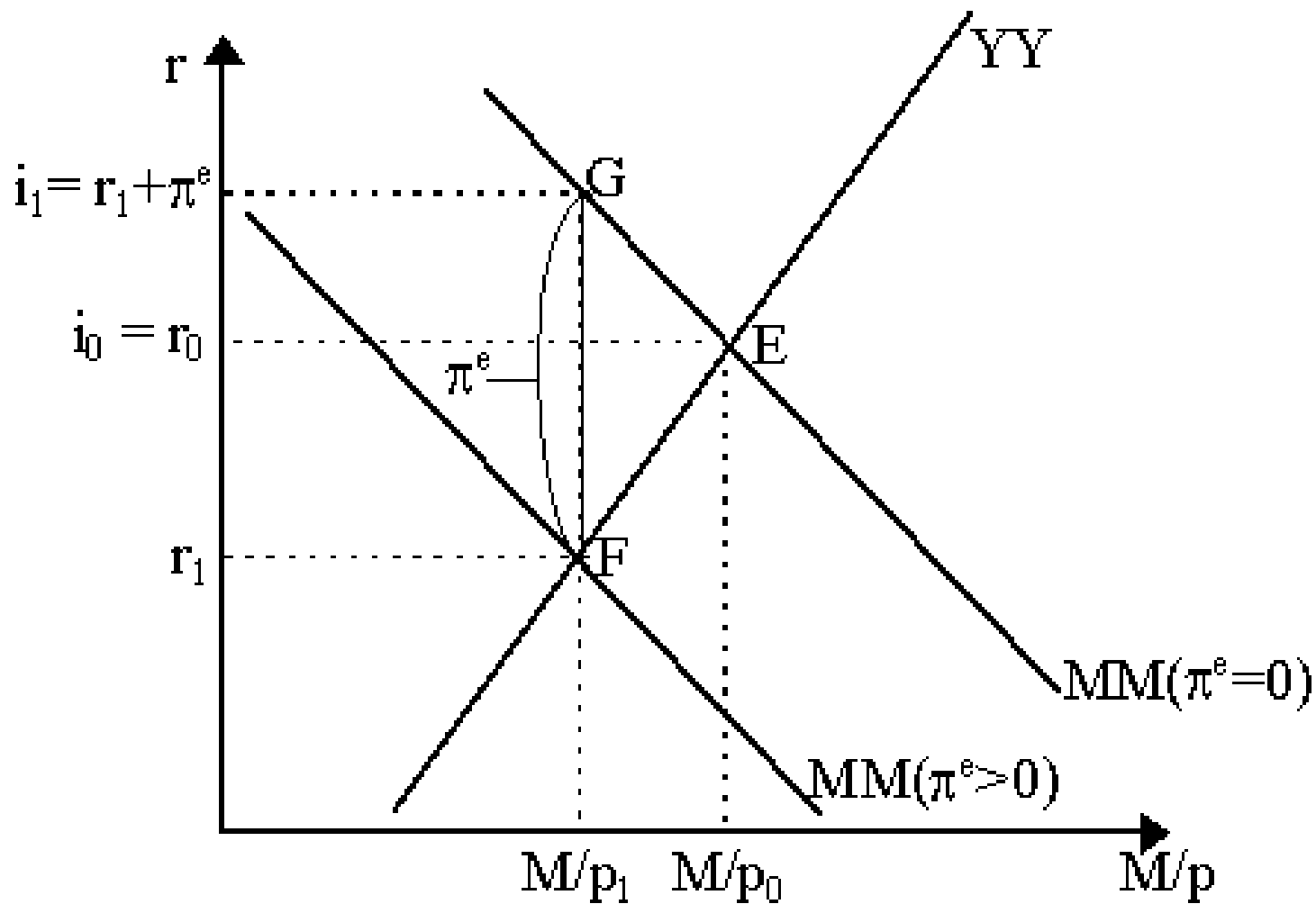


Figure 2 - Mundell's Inflation-Interest Rates Model

- Suppose, now, that inflationary expectations are zero, $e = 0$, so the $MM(e = 0)$ curve applies. Goods market and money market equilibrium implies that we achieve equilibrium E where money supply is M/p_0 and real and nominal interest rates are equal to each other at $i_0 = r_0$. We can now trace out the consequences of an exogenous increase in inflationary expectations. By raising inflationary expectations to some positive amount, $e > 0$, the MM curve shifts down to $MM(e > 0)$. The new equilibrium rate of real interest, r_1 , is at point F in Figure 2, where $MM(e > 0)$ and YY intersect. However, as now $i = r + e$, then a "wedge" of size e is created between the old MM curve and the new one: the new real rate is r_1 at the intersection of YY and the new MM curve (point F) and the new nominal rate is i_1 at the point of intersection between old curve $MM(e = 0)$ and YY curve (point G). Obviously, then, the introduction of inflationary expectations has increased the nominal interest rate from i_0 to i_1 , but the amount of the increase is *less* than the full amount of expectations, e . In other words, the real rate of interest has fallen by *less* than the full amount of inflationary expectations.

- What is happening, intuitively? A higher expected rate of inflation drove up the nominal rate. This, consequently, made bond more attractive relative to money. Consequently, agents attempted to get rid of their excess money holdings by bidding up the price of bond and thus drove the real rate of return on bond down. This collapse in the real rate of return will induce more investment, but as we are at a fixed level of output, then consequently something else must give way to keep aggregate demand constant - namely, consumption. We do this by bringing the money supply down from from M/p_0 to M/p_1 and so, by the Pigou Effect, consumption falls and thus aggregate demand returns to its initial level.

- The reason why nominal rates did not rise one-for-one with inflationary expectations was due to the portfolio shiftings of households away from money and towards bond, which drove its real rate down. This effect was not anticipated by Irving Fisher in the original Neoclassical loanable funds story - although it could be incorporated in it. Thus, the alternative "loanable funds" interpretation of the Mundell story would be that agents increase demand for capital but since capital cannot be increased, this will raise prices, which will lead to a collapse in the money supply which, by the Pigou Effect, reduces consumption and increases savings, consequently reducing the required rate of return on capital and thus bringing investment back up.

- Of course, it might be possible to restore the original Fisher effect by allowing banks to pay interest on deposits. In this case, the fall in the return on money (i.e. inflation) could be compensated one-for-one with a rise in the return on deposits - thus leaving people happy enough with the existing portfolio. Furthermore, as Edmund Phelps (1965) demonstrates, strange things can happen when we add a government to the story and make inflationary expectations endogenous to an increase in money supply. Suppose the government increases money supply in order to finance an expansionary fiscal deficit. Then, aggregate demand rises to $Y^d = C(r, Y, V) + I(r) + G$. If output is to be the same, then either r must rise or M/p fall - thus the YY curve must shift to the left. As a result, any inflationary expectations induced by the government action, which shift the MM curve down, may or may not decrease the real rate of interest - it depends on the relative size of the shifts. However, if money supply rises via open market operations, then bond holdings are reduced and thus the IS curve will shift to the right by the real-balance effect and thus the inflationary expectations-induced fall in MM will reduce the real rate *more* than if the government was not involved.

- In sum, Mundell's (1963) proposition was that inflation (rather, inflationary expectations) will have real effect on the economy by inducing people to move away from money and towards capital. James Tobin (1965) incorporated Mundell's proposition in his famous monetary growth model and obtained the result that inflation could have a positive influence on growth if it induced people to move away from money and towards capital accumulation. This effect of inflation and inflationary expectations on portfolio balances has since become known as the "**Tobin-Mundell**" effect and was used by James Tobin (1975, 1993) and Bradford de Long and Larry Summers (1986) to counter the claim that price flexibility would draw the Keynesian unemployment equilibrium towards full employment. Namely, with deflation induced by labor market conditions, the return on money increases and so, by deflationary expectations, agents will move away from illiquid assets and towards money - thereby increasing money demand and pushing the LM curve to the left, reducing output further. Thus, wage and price flexibility in unemployment situations could easily lead to more as opposed to less unemployment.

-

Thank You