



Does Money Matter?

¹Raushan Kumar Saha ²Sayantani Debdas ³Soham Bandyopadhyay

^{1,2} Student, B.Sc. Economics Honours, St. Xavier's College (Autonomous), Kolkata, Kolkata, India.

³ Student, B.Sc. Statistics Honours, St. Xavier's College (Autonomous), Kolkata, Kolkata, India.

ABSTRACT

Money is a system that facilitates exchange in goods and services. Changes in monetary policy affect real economic activities in the short run but affect prices in the long run. The central role of money in exchanging goods and services is that prices are given in the state of money. The Reserve Bank of India controls money supply by conducting monetary policy using a number of tools which includes buying and selling government bonds and securities in the open market, setting reserve requirements, influencing interest rates and most importantly, The Reserve Bank of India has its control over printing of money.

In this paper, we will examine monetary policy and policy mix. With special reference to the role of expectation we begin the full employment model with real balance effect. Next we will consider an ISLM model with distinction between real and nominal interest rate. We will explain the policy mix in the context of a shift in the composition of aggregate demand in favour of investment and away from consumption. Incorporating economic and financial data from a national scale, we have presented in our paper the various interpretations and associations between the factors in the use of the model we aim to build. The visualizations made on M3 and other economic deflators tend to inform us about the underlying trend of the movement of the factors over time, which can be useful in predictive analysis of our model. Subsequently, we will examine the consequences of monetary expansion under adaptive and rational expectation.

KEYWORDS: real balance effect, rational expectation, inflation, policy mix, monetary policy

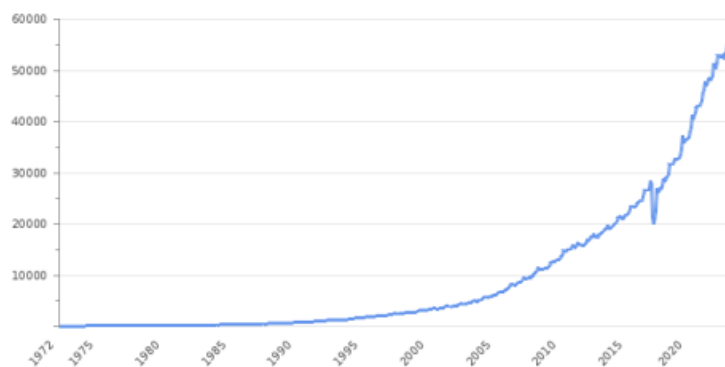
JEL CLASSIFICATION: E31, E52, E58

1. INTRODUCTION

Money is the most liquid asset that economists rely on to facilitate day to day transaction and power financial growth. Money replaced the barter system which was previously used by people to obtain goods and services. Besides being a medium of exchange, money also serves as an unit of account and a store of value.

Money supply refers to a total stock of money on a specific day in an economy is directly controlled by Reserve Bank of India by influencing the interest rate, printing money etc . Reserve Requirement are the amount of funds that a bank holds in reserve to ensure that it can meet liabilities in case of sudden withdrawals. Reserve Requirement is a tool that is used by the central bank to increase or decrease money supply in the economy and influence interest rate.

Policymakers nowadays are more interested in tagging monetary policy and interest rate policy since monetary policy directly affect interest rate in the economy like interest rate for housing loans, business loans and interest rate on saving account. An increase in interest rate would lead to a rise in the cost of taking loans from the bank which in turn would need the people to invest less. On the other hand an increase in interest rate would stimulate a person to deposit more money in the bank being tempted by the increase in return that he would repeat. Thus changes in interest rate influence a person's decision to invest or consume.



(a)

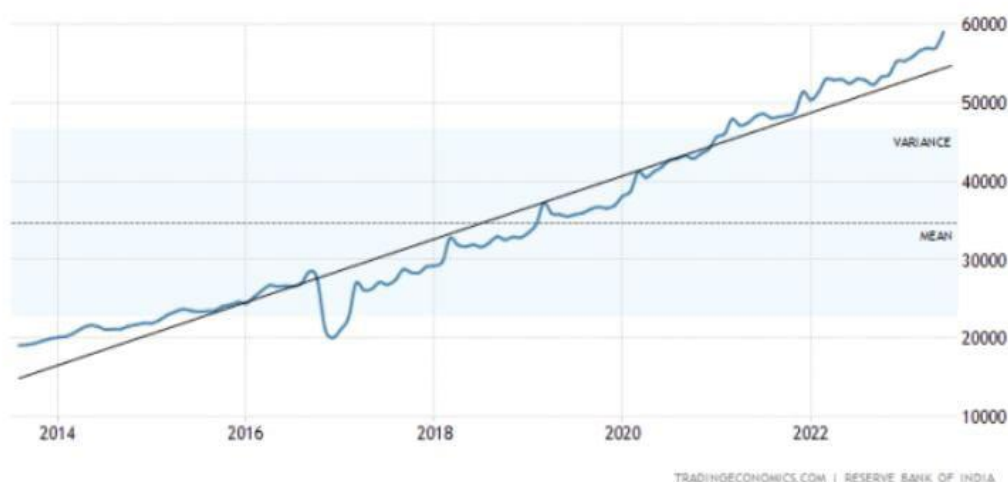
The graph (a) provided above shows the money supply in India.

There are four alternative measures of money supply-M1, M2,M3, M4.

M1 (Narrow Money)

M1 includes all the currency notes being held by the public. It also include all the demand deposits with all the banks both saving as well as current account. It also includes all the other deposits of the bank kept with the RBI. So

$M1 = CC + DD + \text{other deposits}$



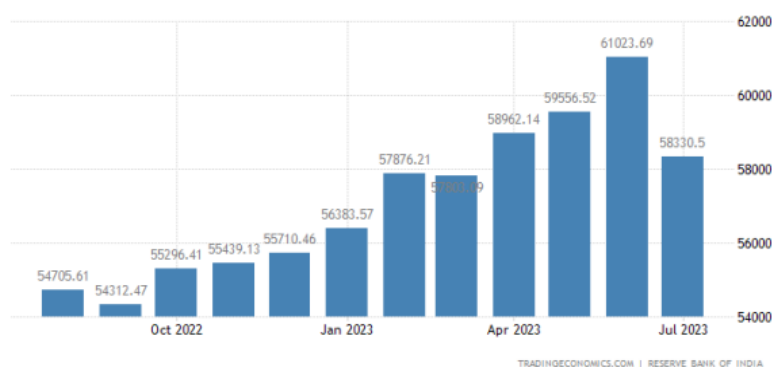
(b)

In graph (b) it is shown that money Supply M1 in India is expected to be 57000.00 INR Billion by the end of this quarter, according to Trading Economics global macro models and analysts expectations. In the long-term, the India Money Supply M1 is projected to trend around 57000.00 INR Billion in 2024 and 56000.00 INR Billion in 2025, according to our econometric models.

M2

M2, also known as narrow money, includes all the inclusions of M1 and additionally also includes the saving deposits of the post office bank. So

$$M2 = M1 + \text{Savings Deposit of Post office savings.}$$



(c)

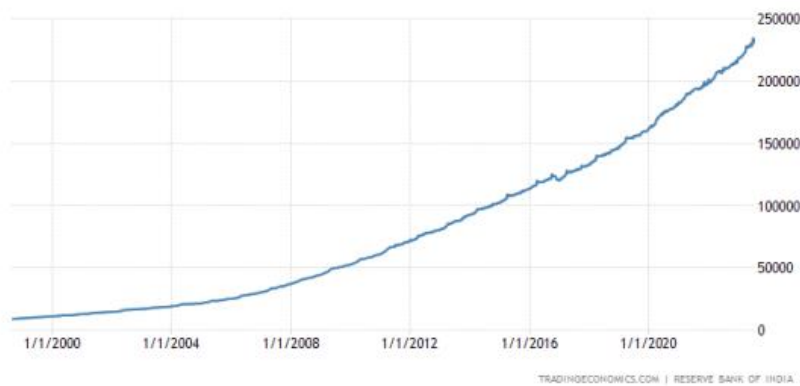
Graph (c) shows that money Supply M2 in India is expected to be 58000.00 INR Billion by the end of this quarter, according to Trading Economics global macro models and analysts expectations. In the long-term,

the India Money Supply M2 is projected to trend around 61000.00 INR Billion in 2024 and 62000.00 INR Billion in 2025, according to our econometric models.

M3 (Broad Money)

M3 consists of all currency notes held by the public, all demand deposits with the bank, deposits of all the banks with the RBI and the net Time Deposits of all banks. So

$M3 = M1 + \text{time deposits of banks.}$



(d)

Graph (d) illustrates that M3 money supply in India rose 10.6 percent from a year earlier to INR 232594.32 billion in the fortnight ended July 28th 2023.

M4 is the widest measure of money supply that the RBI uses. It includes all the aspects of M3 and also includes the savings of the post office banks of the country. It is the least liquid measure of all of the money supply. So

$M4 = M3 + \text{Post office savings.}$

The LM curve is the equilibrium point in the market for economy. The shift of the LM curve is for 2 reasons due to change in money supply and money demand. If the money supply increases (decreases), ceteris paribus, the interest rate is lower (higher) at each level of output or in other words the LM curve shifts right.

The real balance effect is a theory that suggests an increase in the general price level (inflation) reduces the real value of money balances held by individuals. This, in turn, can lead to decreased spending and consumption.

Inflation expectations refer to the anticipations that individuals, businesses, and policymakers have about the future rate of inflation. These expectations play a crucial role in economic decisions and behavior. If people expect higher inflation in the future, they might adjust their spending, saving, borrowing, and investing patterns accordingly, they might reduce their current spending and try to convert money into goods or assets that will retain value better. Central banks also pay close attention to inflation expectations, as they can

influence actual inflation outcomes. If people expect stable and low inflation, it can help anchor their behavior and contribute to stable economic conditions. On the other hand, if inflation expectations become unanchored and people anticipate high inflation, it can lead to a self-fulfilling cycle of rising prices and economic instability. So, the real balance effect and inflation expectations are connected through their impact on consumer behavior and spending patterns.

Consumption is a function of real money balances and inflation expectations. As inflation increases, the real value of money balances decreases, influencing people to reduce consumption and vice versa.

Thus, we aim to an ISLM model with distinction between real and nominal interest rate. We will explain the policy mix in the context of a shift in the composition of aggregate demand in favour of investment and away from consumption.

2. LITERATURE REVIEW

The effect of monetary policy and monetary mix on the economy and the consequences of monetary expansion has been documented in several pieces of literature.

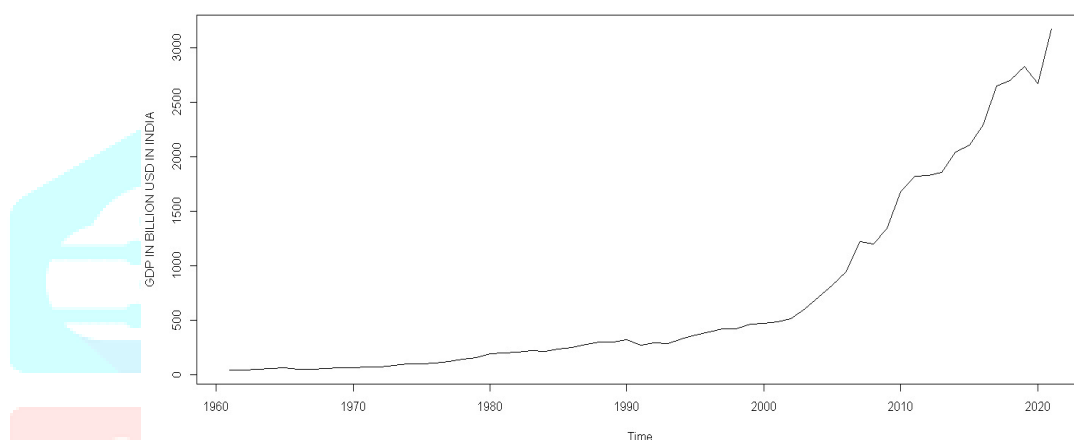
Francesco Bianchi (2017), Cosmin Ilut (2017) concludes that the Great Inflation and its conquest does not rely on latent shocks such as movement in the exogenous inflation target or sunspots inflation ended when both monetary and fiscal policies came in the early '80s, whereas disinflationary attempts were unsuccessful because they were not backed by the fiscal authority. This was provided by a unified theory for the run up of inflation, the failed disinflationary attempts, and the final success in bringing inflation down. Rober J Barro (1976) analysed the role of monetary policy in a model with three major characteristics: 1) Prices and quantities are competitively determined by market clearing relationship that is, by the solution of competitive equilibrium system, 2) Information is imperfect. 3) Expectation of future variable are formed rationally, in the sense of the optimal prediction based in the available information. The focus of the analysis is on the effects of monetary expansion of prices and output.

According to Sudhansh Kumar Sharma (2014), Beena Sharma (2014) monetary and fiscal policy has powerful influence on the pace and pattern of economic growth of a nation. In a developing country like India the major concern of economic policy needs to be diverted and accelerated on the rate of development and in this process, monetary and fiscal policy have a strategic role to play. J Allan Hynes defined real balance effect as a positive partial relation between changes in real money balances and changes in flow spending on currently produced consumption goods at initial interest rates and other prices. According to Don Patinkin (1989) the term "real balance" says is meant the real value of money balances held by an individual or by the economy as a whole. The emphasis on the real, and distinct from nominal, reflect the basic assumption that individual are free as "money illusion". It is a corresponding property of any wealth specified demand function for money that its demand variable is real balances. Sharma Ram Lal (1987) concluded that money is not unique in India as is claimed by the monetarist in the context of the USA. Because bi-directional relationship was found between nominal money and nominal income and the same type of relationship was found between money and real income.

3. STATISTICAL EVIDENCE

1. GDP Deflator analysis with price level

In India, as in most economies, the relationship between inflation and the GDP Deflator is closely intertwined. The GDP Deflator is a measure that reflects the average change in prices of all goods and services in the gross domestic product (GDP). It's a broad indicator of inflation within the economy. The GDP Deflator in India reflects the average change in prices of goods and services produced within the economy and is used as an indicator of inflation. Inflation influences the GDP Deflator by affecting the nominal GDP component, which in turn impacts the overall measurement of economic output and growth. Policymakers and economists closely monitor the GDP Deflator to gauge inflationary pressures and make informed decisions about monetary and fiscal policies.

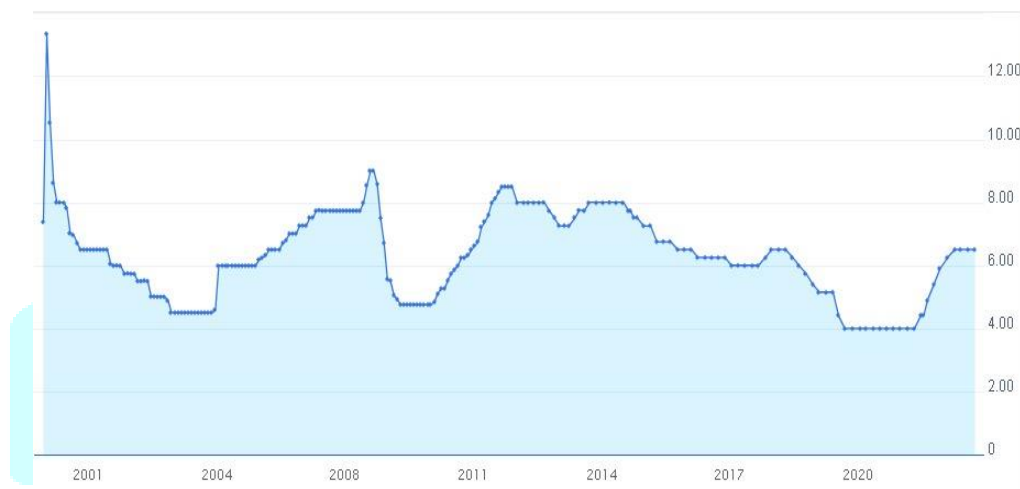


2. India interest rate analysis with price levels.

The Reserve Bank of India (RBI) plays a significant role in influencing the relationship between interest rates and price levels (inflation) in India through its monetary policy decisions. The RBI's main tool for managing inflation is its policy interest rates. Here's an analysis of the relationship between RBI's interest rate and price levels in India:

- **Interest Rates as a Tool:** One of the primary objectives of the RBI is to maintain price stability within the economy. To achieve this goal, the RBI uses its policy interest rates, primarily the repo rate. The Repo Rate is the rate at which the RBI lends money to commercial banks. By changing the repo rate, the RBI can influence borrowing costs and, consequently, spending and investment patterns in the economy.
- **Inflation Control:** When inflation is rising, the RBI might increase the repo rate to make borrowing more expensive. Higher interest rate can lead to reduces borrowing by businesses and consumers, which can dampen spending and investment. This, in turn, can help reduce aggregate demand, which is a contributing factor to inflation.

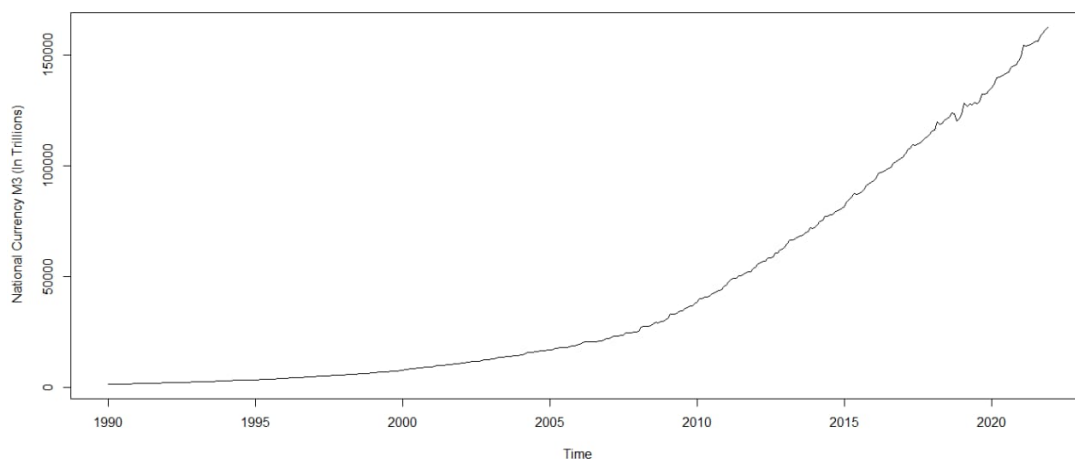
- Impact on consumption and investment: Higher interest rate can lead to decreased consumer spending and reduces borrowing for investments. Consumers might cut back on purchase of big-ticket items like home and cars due to higher loan costs. Businesses might delay or scale down their investment plans due to the increased cost of capital.
- Savings and deposits: Higher interest rates might attract more savings from individuals as they seek to earn better returns on their savings. This can have the
- effect of reducing immediate consumer spending, potentially contributing to a slowdown in economic activity and inflation.



(f)

3. M3 Money supply relation with price levels

It's important to note that the relationship between money supply and price levels is not always straightforward, and the Quantity Theory of Money has its limitations. Factors such as changes in velocity, shifts in demand and supply, and the effectiveness of monetary policy can impact the actual relationship between the M3 money supply and price levels. Additionally, in the short term, other economic factors, like changes in consumers and business confidence, can influence the relationship between money supply and prices. Central Banks like the Reserve Bank of India (RBI), monitor money supply and its potential effects on inflation as part of their monetary policy framework. While the Quantity Theory of Money provides a theoretical foundation for understanding the relationship between the money supply and prices, central banks also consider other economic indicators and factors when formulating policy decisions to maintain price stability and support economic growth.



(g)

4. MODEL

4.1. A FULL EMPLOYMENT MODEL WITH REAL BALANCE EFFECT

Consumption depends not only output and interest rate but also on the real balance. The logic of real balance effect is simple. The greater the value of real balance, the greater the value of real wealth. The precautionary need of saving falls and hence consumption declines. The macroeconomic equilibrium under full employment is represented by following set of equations.

M/P is the real balance.

$$Y_f = C(Y_f - T, r, M/P) + I(r) + G \quad (1)$$

$$M/P = L(Y_f, r) \quad (2)$$

Where Y_f = full employment output.

Equation 1 represents the commodity market equilibrium.

Equation 2 represents money market equilibrium.

From (1) we get the CC curve as locus of combination of Price (P) and interest rate (r).

From (2) we will get the locus of Price and interest rate called LL Curve.

NATURE OF CC CURVE

Suppose that rate of interest (r) rises which in turn causes investment to fall since the cost of borrowing money increases. A higher rate of interest on the other hand induces people to save more money in the bank so that they can obtain a higher return in future which in turn causes a rise in the excess supply in the commodity market, thus, consumption has to rise. This requires rise in M/P and hence a fall in price level (P). Hence CC curve is downward sloping.

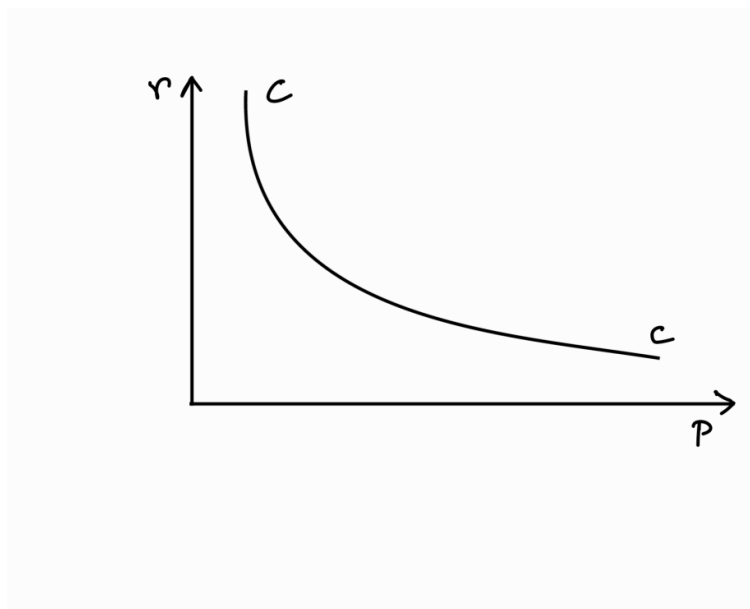


Figure (a)

NATURE OF LL CURVE

Suppose that Price increases. Then M/P falls. Thus excess demand is created in the money market. Hence interest rate rises to convince people to deposit more money in the bank to get a higher return in future. Thus, the LL curve is upward sloping.

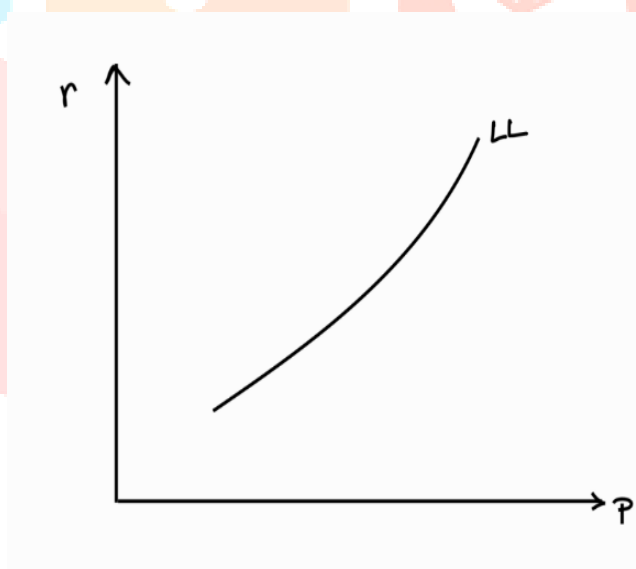


Figure (b)

EQUILIBRIUM

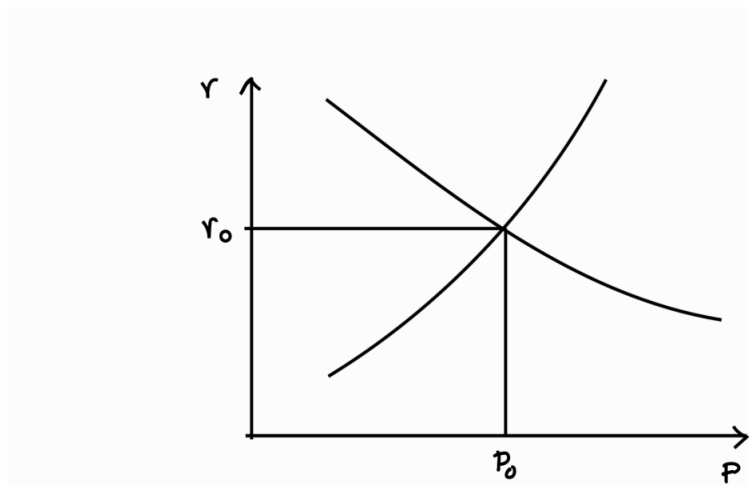


Figure (c)

COMPARATIVE STATICS

Consider an increase in money supply. Since real balance increases consumption rises. The CC curve shifts to right. Since real balance rises, the interest rate falls. The LL curve shifts downward.

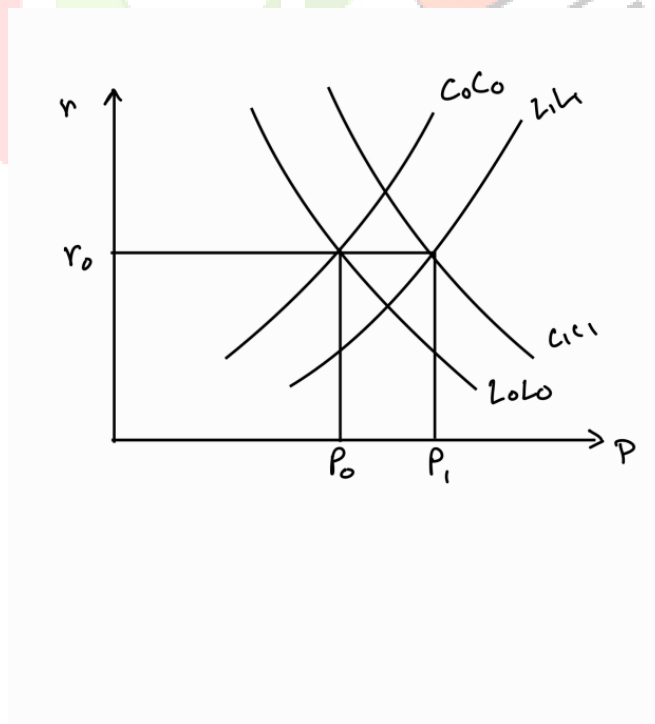


Figure (d)

FORMAL PROOF

Consider equation (1) and equation (2)

Suppose Price rises more than proportionately. From equation (1), consumption decreases.

From equation (2) interest rate increases and investment (I) decreases.

Hence Prices rises equiproportionately and interest rate remains unchanged.

4.2. AN IS-LM MODEL WITH EXPECTATIONS.

First, we note that investment depends on real interest rate and demand for money depends on the real interest rate and demand for money depends on the nominal interest rate. The real interest rate (r) = nominal interest rate (i) – expected inflation rate (π^e). Thus, it can be written as- $r = i - \pi^e$

The equilibrium is represented by the following equations-

$$Y = C(Y - T) + I(r) + G \quad (1)$$

$$M / P = L(Y, i) \quad (2)$$

$$r = i - \pi^e \text{ or, } i = r + \pi^e \quad (3)$$

From 2 and 3 we get,

$$M / P = L(Y, r + \pi^e) \quad (4)$$

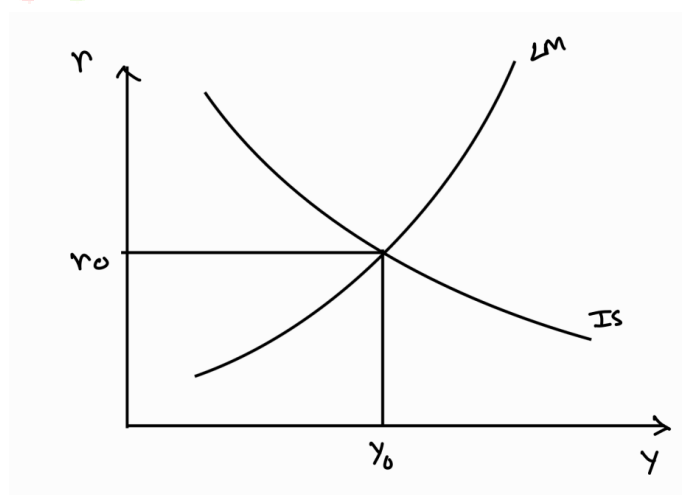


Figure (e)

If we draw IS and LM curves on (Y,i) plane, we will write equations (1) and (2) as:

$$Y = C(Y - T) + I(i - \pi^e) + G$$

$$M/P = L(Y, i)$$

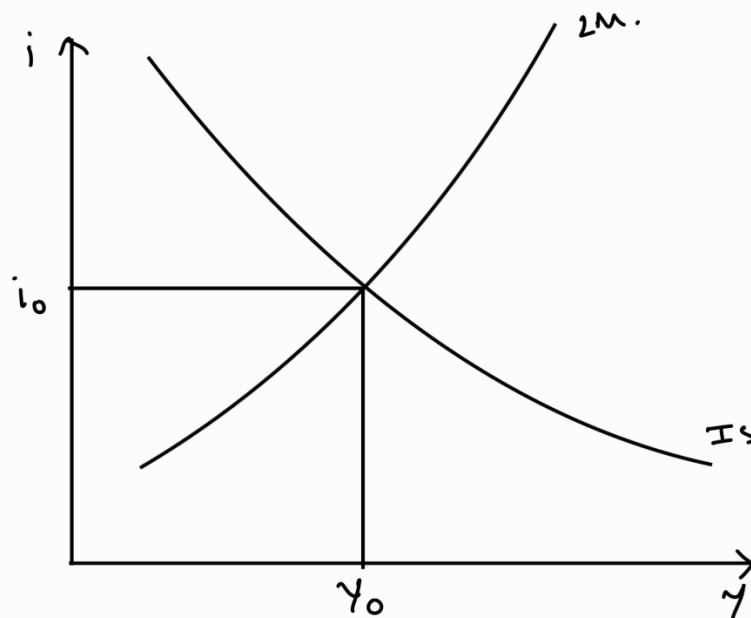


Figure (f)

IS-LM MODEL AND POLICY MIX

We assume that economy operates at full employment, however, government wants investment to rise and consumption to fall while maintaining full employment output. The policy instruments are rising tax and increase in money supply that is both fiscal and monetary policy will be combined.

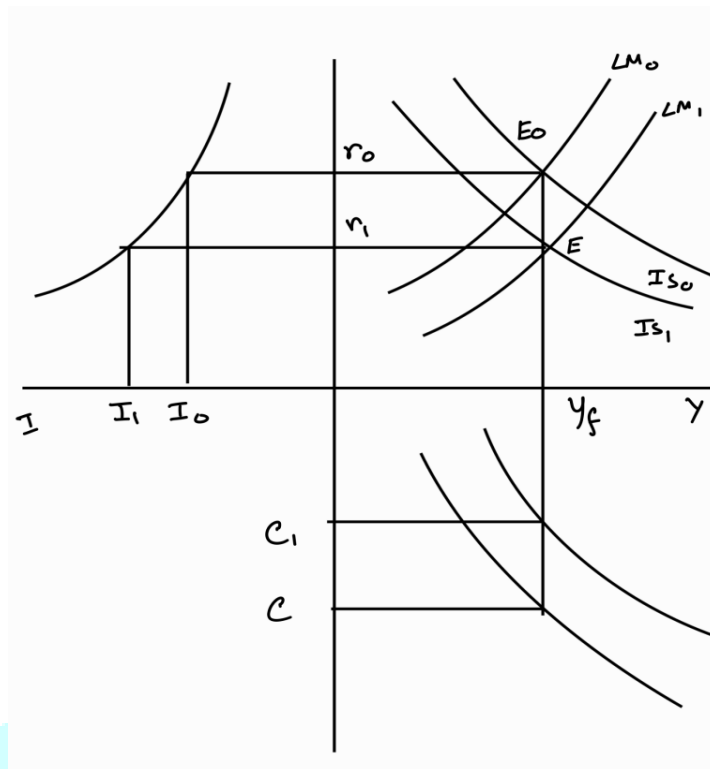


Figure (g)

Let us find the relation between increase in money supply and increase in tax-

$$Y_f = C(Y_f - T) + I(r) + G$$

Taking total differential, we get,

$$-c'dt + I_r dr = 0; \left[I_r = \frac{dI}{dr} < 0 \right]$$

$$dr = \frac{c'}{I_r} dt < 0 \quad (dT > 0, I_r < 0, 0 < c' < 1)$$

$$\frac{M}{P} = L(Y_f, r)$$

Taking total differential,

$$\frac{dM}{dP} = L_r dr \quad ; \quad \left(L_r = \frac{\partial L}{\partial r} < 0 \right) \quad \text{and} \quad 0 < c' < 1$$

$$dM = PL_r dr$$

$$dM = PL_r \left(\frac{c'}{I_r} \right); dT > 0 \quad dT > 0 ; L_r < 0 ; I_r < 0 ; 0 < c' < 1$$

Section 4.3. EXPECTATION AND MONETARY POLICY

First, we need to define expectation scheme. First, we need to consider adaptive expectation. At any given point in time actual price and expected price may not be same. However, in the long run, Price is equal to Expected price. In the short run, expected augmented supply curve is positively sloped and in the long run, aggregate supply curve is vertical.

Now consider an increase in money supply then price goes up; in the short run, output increases. Over time expected price increases, SRAS shifts upward (leftward). In the long run, expected price is equal to actual price. Output return to its natural level. It follows from the preceding discussion that in the long run, monetary expansion causes equiproportionate increase in both actual and expected price. Thus, money matters in the short run not in the long run.

DIAGRAMMATIC REPRESENTATION OF SHORT RUN ADAPTIVE EXPECTATION

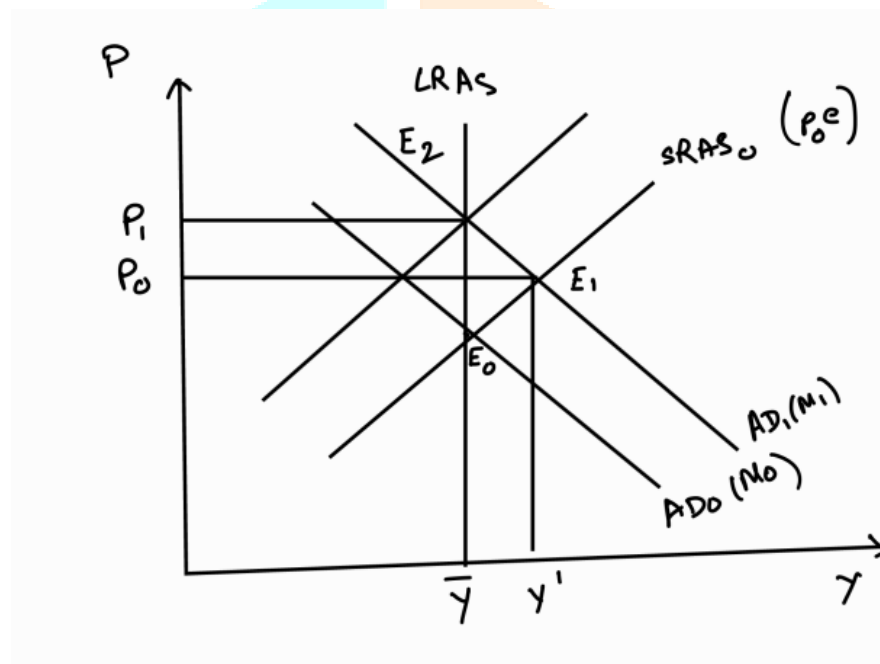


Figure (h)

Money is non- neutral in the short run and neutral in the long run.

Consider an increase in money supply. This causes rightward shift un the AD curve. Given the $SRAS^0$ the output level goes beyond \bar{Y} , that is the natural level of output that is the output in Y' . Over time, expected Price level rises and the SRAS curve shifts upward and finally equilibrium occurs at E_2 corresponding to \bar{Y} . Hence Milton Friedmann proposition that

“Money is non-neutral in the short-run and neutral in the long run” is vindicated.

Under Rational Expectation

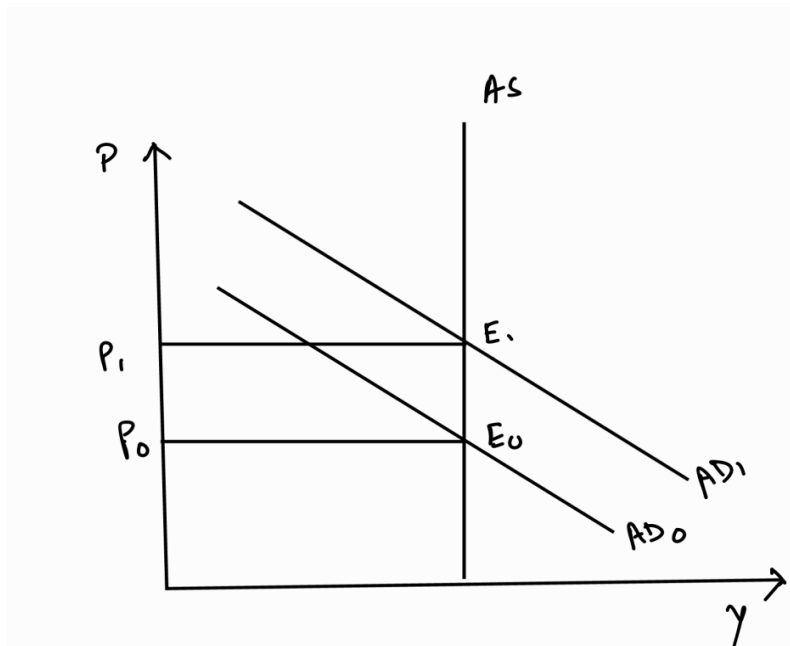


Figure (i)

Under rational expectation, $P=P^e$. Both SRAS and LRAS are vertical. Hence money is neutral. Rational expectation extends adaptive expectation further. It shows that even in the short run money does not matter.

5. CONCLUSION

Patinkin used the real balance effect theory to explain that an increase in the amount of money in the economy directly affects the demand and the relative price levels and then the absolute price levels. This is because as the price rises, the real purchasing power of money shrinks which in turn stimulate people to save more and consume less.

The rational expectations hypothesis states that people use the best available information in the market to make forecasts about future economic activity and the price level and they adjust their behaviour to these forecasts. On the other hand, in case of adaptive expectations, the policymakers make use of the trends of inflation in the recent past to predict what the future inflation rate can be, that is, if inflation rate in the recent past was higher, then people will expect a higher rate of inflation in the current year. Thus, rational expectations make use of the presently available data whereas adaptive expectations utilize data from what already occurred in the past to forecast inflation rate.

The effectiveness of the monetary policy depends on the market expectation of the future. Monetary policy directly affects inflation. Increase in money supply causes more money to circulate in the economy which in turn requires prices of commodities to increase thereby causing inflation. Now, if the workers expect an increase in price level, that is, inflation in the near future, then they will start demanding a hike in wages immediately to cope up with the rise in price level which in turn would elevate the cost of production and

the price level. Thus, rational expectations suggest that monetary policy does not have any impact on the real variables such as total output or the unemployment rate. Whereas Friedman suggests that workers who form adaptive expectation of the inflation rate analysing the past year trends can be easily surprised by the government through unexpected monetary policy changes.

An increase in money supply increases the aggregate demand which in turn pushes the output level beyond the natural level of output given the short run aggregate supply curve. Gradually, expected price level rises and the supply curve moves upward that is supply falls and finally output comes back to its natural level in the long run. Thus, an expansionary monetary policy causes a short run positive relation between the quantity of output and the price level which is neutralised in the long run. Thus, money is a “neutral” factor that has no real effect on economic equilibrium. However, in our paper we have used an instance where with an increase in money supply aggregate demand rises and also the expected price level, keeping the aggregate supply curve constant, thereby keeping the level of output at its natural level. Thus, monetary policy is neutral even in the short run.

Thus, in our study, we have precisely established analytical relations between adaptive and rational expectation with monetary policy and policy mix with the help of ISLM framework. We can shed profound light on the fact that though money matters in the short run but the overall effects of money fluctuations are ruled out in the long run.

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