Unified theory of Unemployment

Ratan Kirti

JSS Academy of Technical Education Noida sector 62 A-20/1India pincode-201301
kirtiratan912@gmail.com

Abstract

Background: The relationship between labour unemployment in developing economy, Keynesian unemployment and Phillips curve is yet to be completely understood the traditional view completely separates labour unemployment in developing economy from Keynesian unemployment, this paper parts away from this view and seeks to establish a relation between them.
Findings: The presence of a trade off between inflation and unemployment in both developed and developing economy is also inquired into in this paper. Most of the economists believe that labour intensive industry is a characteristic of a developing country while capital intensive of a developed, we also inquire into this view.

Keywords: inflation, unemployment, Phillips curve, rational expectations

JEL Classification: O11, P10, J20, J23,

1. Introduction

There has been recent development in the field of Keynesian unemployment or new Keynesian Phillips curve (NKPC), there is a very agreeable view among the economist that unemployment generated in the developing countries is a long term sustaining type of unemployment and as the economy develops this type of unemployment (i.e. unemployment generated in the developing countries) gradually shifts towards Keynesian unemployment (i.e. cyclical unemployment).

The Phillips curve on the other hand tries to develop a direct relation between inflation rate and unemployment rate. This view is generally regarded as a part of Keynesian unemployment. It is however said that Phillips curve is an un-debatable question in developing economies.

The nature of unemployment in a developing economy is rather a transitional phase toward the cyclical unemployment of a developed economy, once we compare the Phillips curve in the two kinds of economies we might be able establish a more concrete relation between the two. According to the popular view of rational expectation put forward by Friedman- there is no trade off between inflation and unemployment in the long-run, however this view cannot not be successfully implied to developing economies as suggested by Benjamin Maturu in his paper- A new Keynesian Phillips curve for Kenya- due to presence of backward looking rational expectation and wage sickness.

2. Discussion

The objective of this paper is to seek a relationship between labour unemployment in developing economy, Keynesian unemployment and Phillips curve, we will move forward by making following assumptions—

- The wage and rent of labour and capital respectively are determined by supply and demand of the two.
- When the wage of a labour and rent of capital becomes equal to their respective marginal productivity only then a long-run equilibrium is established in any industry.
- Cobb-Douglas production function is valid.
- The functioning is under a closed and developing economy with mobility of capital from abroad only.
- The central bank does not create new money i.e. no new money is created in the economy.

Under perfect mobility of resources within a closed economy the wage of labour is determined by supply and demand for labour similarly rent of capital is dependent on supply of capital from abroad and its demand in the developing economy.
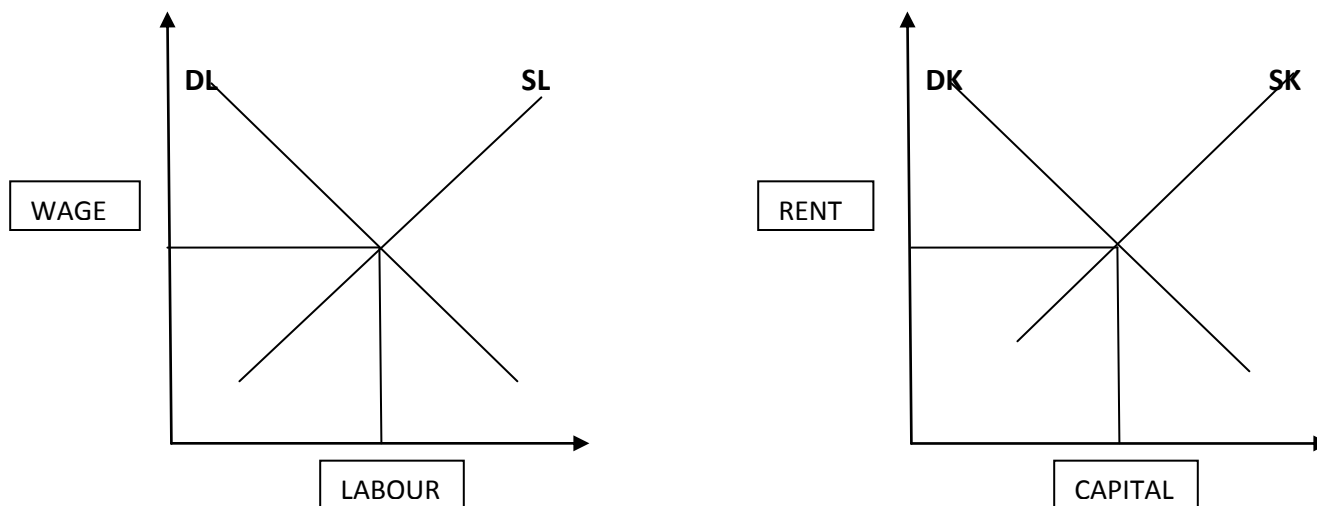
Phase 1—

In a developing economy the economic growth is predominantly dependent on agriculture or primary sector which is definitely labour intensive in nature. Let us see how—

An equilibrium condition is established when the wage equals marginal productivity of labour and rent equals marginal productivity of capital, by Cobb-Douglas production function we can simply say that—

$$Y = AL^{\alpha}K^{1-\alpha}$$

Wage $w= \dfrac{dY}{dL}= A\alpha L^{\alpha-1}K^{1-\alpha}$;

While,

Rent $r=\dfrac{dY}{dK}= A(1 - \alpha)L^{\alpha}K^{-\alpha};$

A developing economy with low income cannot invest much into capital, hence to compensate for loss of productivity of capital it must employ more labour to the extent of the marginal rate of technical substitution MRTS

$$MRTS = \frac{MPL}{MPK}$$

This causes the demand of labour to further increase, if we accept law of diminishing marginal productivity to some extent then we can come to a conclusion that after the employment of certain amount of labour the marginal productivity of labour will reduce. With increase of labour employment in agriculture sector the income level shall rise, this rise in income level will cause increase in aggregate demand but aggregate supply is unable to increase at the same pace due decrease in productivity of labour thus a condition for inflation prevails.

We know that for Keynesian multiplier to function the most important condition is that the labour must spend it income in the market else money will not exchange hands, thus it is only labour and not capital that is capable of

doing so. If we assume labour wage across the economy to be constant and equal to w=wage. Now with propensity to save being constant and equal to s=MPS we can write the following equation. The below gives an equation that represents the total income generated is saved and invested, given away as wages and rent.

$$Y = sY + wL + rK$$

$$Y - sY = wL + rK$$

$Y(1 - s) = wL + rK$ But 1-s equals to propensity to consume= c, therefore

$$Yc = wL + rK$$

Phillips curve is a plot between rate of inflation and unemployment rate, if we assume the money supply from central bank to remain constant then the inflation rate would only be determined on the basis of aggregate demand and supply and not on the basis of monetary policy.

If, Y_{t-1}= aggregate output at time t-1 and Y_t= aggregate output at time t i.e. present aggregate output.

If $cY_{t-1}=wL_{t-1}+rK_{t-1}$ and $cY_t=wL_t+rK_t$ such that $L_t > L_{t-1}$

Therefore total income of labours raises by $(L_t - L_{t-1})w$ but output raises by $Y_t - Y_{t-1}$

 Under stickiness of wage with respect to productivity, if $\Delta Lw > \Delta Y$ only then inflation will occur i.e. if and only if $\frac{\Delta Y}{\Delta L} < w$.

The above equation suggests that Marginal productivity of labour is less than the wage of the labour now, to establish an equilibrium in the long run the industry will get rid of labours until $\frac{\Delta Y}{\Delta L} = w$, i.e. unemployment generation or the industry can decrease the wage w than to cause unemployment to establish an equilibrium condition.

With decrease in ΔL unemployment will prevail and wage rate w will remain constant while when w is decreased then unemployment will not prevail as ΔL=0

Thus Friedman view of long-run Phillips curve is established to be correct even in a developing economy as it suggests that finally there is establishment of equilibrium between wages and marginal productivity thus there is no trade-off between inflation and unemployment in the long-run.

Decrease in Wage rate (w)

Decrease in Labour (ΔL)
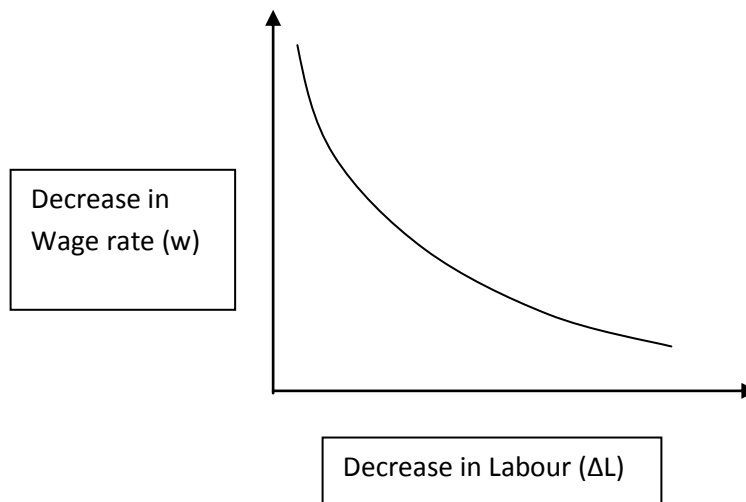
We know,

Decrease in labour employment is nothing but unemployment and decrease in real wage will cause inflation, thus a direct relation is finally established—
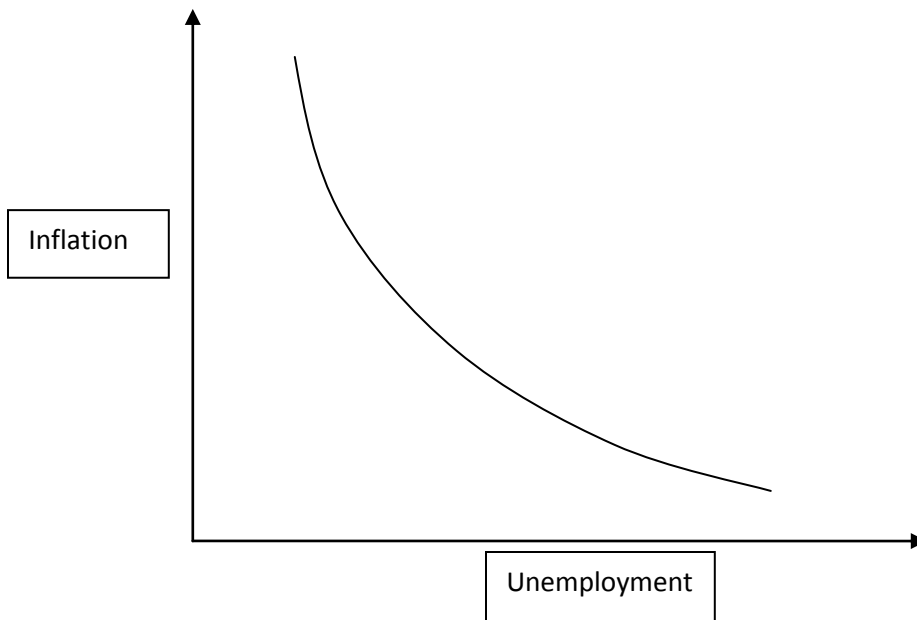
We have finally established the existence of a Phillips curve even in a developing economy.

Phase 2—

As the economy progresses the income level will rise, with this rise in income the saving will also increase. Higher savings in the economy should result in higher investment, now under a capitalist economy a large sum of investment will be made in capital intensive sector.

As we saw in the previous phase that due to decreasing marginal productivity of labour it will be only logical to invest into capital intensive industry. We are now going to move forward under the assumption that as the income level rise the economy will start to invest in capital intensive industry, with increase in demand of capital the rent will rise but demand for capital will go on increasing until a condition prevails where marginal productivity of capital will decrease and become equal to marginal productivity of labour.

Thus according to Cobb-Douglas production function the capital input will keep on rising until- $\frac{dY}{dL} = \frac{dY}{dK}$,

But this condition is not enough to stop the capitalist from purchasing more capital as now the capitalist will employ that factor of production whose price is lesser i.e. if wage(w)> rent(r) it will prefer to buy capital and vice verse however such a condition will prevail only in short-run.

While in the long-run an equilibrium condition will prevail where $\frac{dY}{dL} = \frac{dY}{dK}$ and wage=rent.

Using Cobb-Douglas production function we derive the following condition—

$$\frac{dY}{dL} = A\alpha L^{\alpha-1} K^{1-\alpha}$$

$$\frac{dY}{dK} = A(1-\alpha)L^\alpha K^{-\alpha};$$

Now, $A\alpha L^{\alpha-1}K^{1-\alpha} = A(1-\alpha)L^\alpha K^{-\alpha}$

Therefore, $\frac{\alpha}{1-\alpha} = \frac{L}{K}$;

But as we have seen that rent and wages are sticky as compared to change in marginal productivity and they also tend to be equal in the long-run only, by assuming no change in money supply by the central bank in the economy we will establish the following relation—

Case 1-If wage rate w> rent r while the above condition prevails i.e. MPL=MPK at the same time then the capitalist will employ more of capital thus causing increase in unemployment.

Case 2-While when wage rate w< rent r then capitalist will employ more of labour.

Establishment of relationship with inflation—

In case 1 where w>r there will not be inflationary pressure as real wage rate do not decline, but in case 2 where w<r inflationary pressure will prevail as real wage has declined.
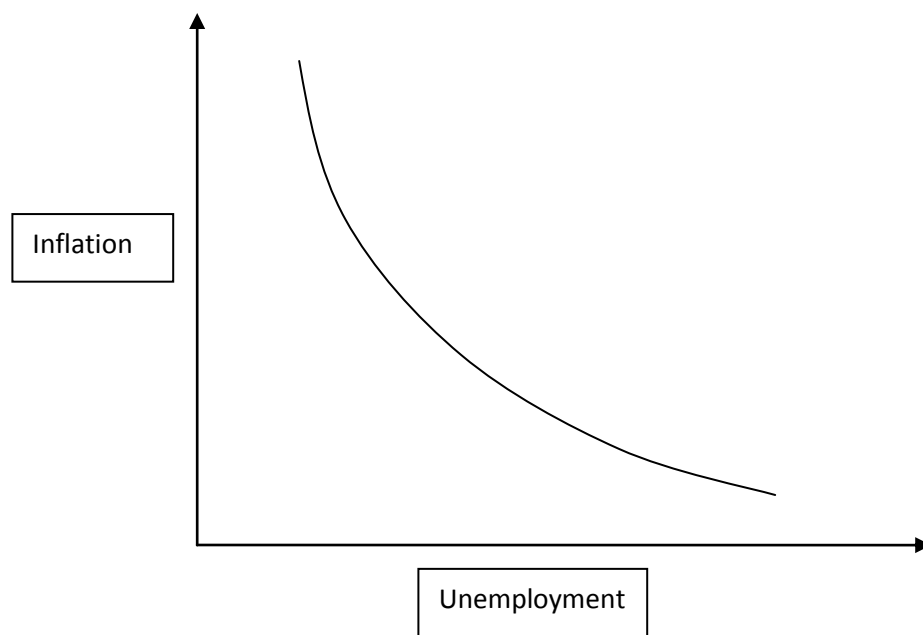
However in long-run there will be a condition where equilibrium is established when MPL=MPK; w=r such a condition signifies Friedman long-run Phillips curve.

3. Conclusion

The presence of Phillips curve in developing economy is explained with help of stickiness of wage and rent. There is a need to introduce another parameter that can reflect this stickiness of wages with respect to marginal productivity of labour.

It can also be seen that equilibrium condition can only prevail when MPL becomes equal to wage rate, presence of short-run Phillips curve is the result of disequilibrium between MPL and wage rate.

The natural cause of Phillips curve in a labour intensive economy and capital intensive economy may be different but the result we arrive at are the same. As we can see that in a labour intensive economy the trade-off prevails only

because of over employment of labour while in capital intensive economy it occurs because of inequality of wage and rent.

It is however said that Phillips curve is an un-debatable question in developing economies.[1] According to the popular view of rational expectation put forward by Friedman- there is no trade off between inflation and unemployment in the long-run[2]. In a developing economy the economic growth is predominantly dependent on agriculture[3,4,9]. If $cY_{t-1}=wL_{t-1}+rK_{t-1}$ and $cY_t=wL_t+rK_t$ such that $L_t > L_{t-1}$,in a developing economy as output increase more will be the share of labour.[3,6]. Under stickiness of wage with respect to productivity, if $\Delta Lw > \Delta Y$ only then inflation will occur i.e. if and only if $\frac{\Delta Y}{\Delta L} < w$.[5,] As we saw in the previous phase that due to decreasing marginal productivity of labour it will be only logical to invest into capital intensive industry.[7,8]

4.   References

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