Harris - Todaro Model of Migration and Unemployment

The Harris-Todaro (H-T) model is based on the experiences of tropical Africa facing the problems of rural-urban migration and urban unemployment. The labour migration is due to rural-urban differences in average expected wages. To remove urban unemployment, Harris and Todaro suggest a subsidised minimum wage through a lumpsum tax.

Assumptions :

1- There are two sectors in the economy; the rural or Agricultural sector (A) and the urban or manufacturing sector (M).

2. The rural sector produces X_A units of agricultural goods and the urban sector produces X_M units of manufactured goods. Each sector produces only one unit.

3- The model operates in the short run.
4- Capital is available in fixed quantities ($\bar{K}$) in the two sectors.
5- There are N workers in economy with N_A and N_M numbers employed in the rural and urban sector respectively.
6- The number of urban jobs available (N_M) is exogenously fixed. In the rural sector some work is always available. Therefore, the total urban labour force comprises $N - N_A$ alongwith an available supply of rural migrants.
7- The urban wage is fixed at W_M and the rural wage at W_A, $W_M > W_A$.
8- The rural wage equals the rural marginal product of labour and the urban wage is exogenously determined.
9- Rural-Urban migration continues so long as the expected urban real income is more than the real agricultural income.
10- The expected urban real income is equal to the proportion of urban labour force actually employed multiplied by the fixed minimum urban wage.
11- There is perfect competition among producers in both the sectors.
12- The price of the agricultural goods is determined directly by the relative quantity of the two goods produced in both the sectors.

Model

Give the assumptions, Harris – Todaro explain their model mathematically.

Output in rural sector is function of labour

$$X_A = f(N_A, \bar{L}, \bar{K}_A) \qquad f' > 0; f'' < 0 \quad \text{—— (1)}$$

where,

$X_A \rightarrow$ output of agricultural goods

$N_A \rightarrow$ Rural labour units employed to produce this output.

$\bar{L} \rightarrow$ fixed given labor.

$\bar{K}_A \rightarrow$ Fixed quantity of available capital in the rural sector.

Similarly, output in the urban sector

$$X_M = f(N_M, \bar{K}_M) \qquad f' > 0; f'' < 0 \quad \text{—— (2)}$$

where →

$X_M \rightarrow$ Output of Manufactured goods

$N_M \rightarrow$ Urban labour units

$\bar{K}_M \rightarrow$ fixed quantity of available capital in the urban sector.

Total labour available in the economy is N.

$$N_A + N_M \leq N \qquad N_A; N_M \geq 0$$

Price determination

$$P = P\left[\frac{X_M}{X_A}\right] \qquad P' > 0.$$

where →

$P \rightarrow$ price of agricultural goods in terms of the price of manufactured goods which is a function of the relative output of agricultural and manufactured goods.

The agricultural wage equals the value of marginal product (MP) of labour expressed in terms of the manufactured goods,

$$\omega_A = f_A(N_A) = P(f'_M) \quad \text{——— (4)}$$

In the urban sector, the producers are wage-takers and they aim at profit maximisation ~~which~~

$$\omega_M = f'_M(N_M)$$

However, in this economy, the urban real minimum wage ($\bar{\omega}_M$) is at a lower level due to institutional or political factors.

$$\omega_M = f' \geq \bar{\omega}_m . \quad \text{——— (5)}$$

Wage in the urban sector is equal to MP of labour because of the price taking behaviour of producers. This assumption is called the <u>wage-rigidity axiom.</u>

Assuming wage to be flexible, if wages are above $\bar{\omega}_M$, there will be an excess supply of labour in the urban sector and competition among producers will drive ω_M to the level $\bar{\omega}_M$. Thus profit maximisation condition becomes

$$\bar{\omega}_M = f'_M(N_M) .$$

The urban expected wage which leads to the migration of workers from the rural to the urban sector is

$$\omega_M^e = \bar{\omega}_M \cdot \frac{N_M}{N_U}, \quad \frac{N_M}{N_U} \leq 1 . \quad \text{——— (6)}$$

where,

the expected real wage (w^e_u) in the urban sector is equal to the urban real minimum wage (w_M) adjusted for the proportion of the total urban labour force (N_u) actually employed. when $N_M/N_U = 1$, there is full employment in the urban sector and the expected real wage equals the real minimum wage, i.e $w^e_u = w_M$.

The total labour endowment ($\bar{N}$) in the economy is

$$\bar{N} = \bar{N}_A + \bar{N}_U = N_A + N_U. \quad \text{——— (7)}$$

The equilibrium condition is

$$w_A = w^e_u \quad \text{——— (8)}$$

This is based on the hypothesis that migration from the rural to the urban sector is positive function of urban-rural wage differential.

$$N_U^* = f\left(w_M \cdot \frac{N_M}{N_U} P f'\right) \quad . \quad f' > 0;\ f(0) = 0 \quad \text{——— (9)}$$

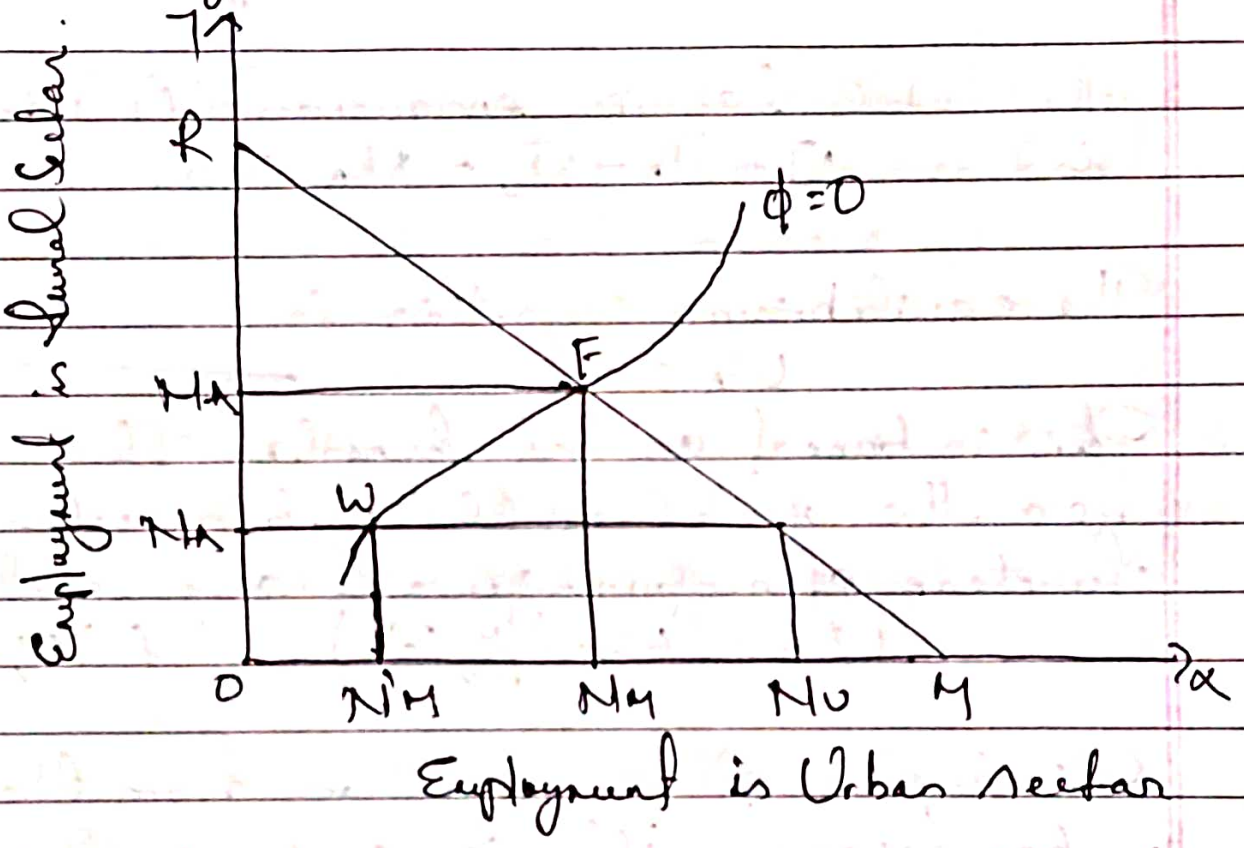
This implies that migration from the rural to urban sector will cease when the expected wage differential is zero i.e $w_A = w^e_u$.

This completes the description of an H-T economy. But the above condition does not ensure equilibrium in the entire economy. This requires satisfying equations from (1) to (8). The H-T model contains eight equations and eight unknowns: $X_A, X_M, N_A, N_M, w_A, w^e_u, N_U$ and P.

In the H-T model, migration is disequilibrium phenomenon. Equilibrium is sub optimal one which is characterised by unemployment.

$$\bar{W}_m \cdot \frac{N_M}{N_U} = pf'$$

H-T model also can be explained ~~through~~ with help of diagram.



The line RM represent the full employment equilibrium in the economy. There exists a unique equilibrium on the line $\phi = 0$. Point F is the only full employment equilibrium point at which N_A number of workers are employed in rural sector and N_M in the urban sector. All points on the line $\phi = 0$ lying above and to the east of F are not feasible while points to the left of F are associated with a minimum wage higher than the full employment wage. Suppose a minimum wage is set above

the full employment level somewhere in the area to the west of F. Competition among producers will tend the economy to ~~the~~ settle at the minimum wage point W at which N'A workers are employed in the rural sector and N'M in urban sector. The minimum wage W gives the minimum loss of unemployment and output in the two sectors and represents a sub-optimal situation for the economy.

~~Criticisms~~

Policy Implications

1- The opportunity cost of labour in the two sectors differ. The creation of an additional job in the urban sector reduces agricultural output through induced migration. On the other hand, additional employment can be generated in the agricultural sector without reducing output in the manufacturing sector.

2- Substituting the minimum wage in the urban sector does not provide optimal employment and output in the urban sector. It reduces unemployment and output in the agricultural sector.

3- The payment of subsidised urban minimum wage to additional workers shall increase total consumption thereby reducing resources available for investment in the economy.

4- Harris and Todaro favour certain lumpsum taxes in order to finance wage subsidy. But this will reduce the amount of job creation in the industrial sector.

Criticism:

1- Harris and Todaro suggest non-distortionary lumpsum tax to finance subsidy. But a lumpsum tax is seldom non-distortionary.

2- The H-T model does not take into consideration the generation of savings as a source of financing subsidy.

3- This model does not incorporate the costs of rural-urban migration or the relatively higher costs of urban living which the migrants have to incur in the urban sector.