Should informal sector be subsidised?

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1 INTRODUCTION:

This is the first sentence of my introduction. My paper examines the impact of subsidy policies, given to the informal sector,on urban unemployment and domestic factor income. At the present juncture, it is well known to all development economists that the informal sector provides jobs to many unemployeds. This is true irrespective of the level of development.At the same time, it is also observed that huze unemployment also exists in many countries where informal sector plays important role in the employment generating activities.One question obviously comes: why such huze unemployment exists even when the informal sector is very large? Fields(1975,1989) and Gupta(1993) have explained this1. This paper explains such co-existence in terms of consumption-efficiency hypothesis of Leibenstein(1957). The basic idea of the consumption-efficiency hypothesis is that a worker's efficiency is positively related to the wage rate he receives. This is generally valid in the case of low income workers who consume the whole wage income and suffers from malnutrition. The employers use this wage as an instrument of profit maximisation and the optimum wage appears to be unique and independent of other economic variables. This wage rigidity at the equilibrium level explains involuntary unemployment.

The development literature shows that from time to time Government of many small countries have given output subsidy to the informal sector to combat unemployment, to enhance informal employment and to uplift country's welfare. The present paper tries to explain theoretically the impact of such policy on urban unemployment and domestic factor income where urban formal wage rate is endogenous and urban informal sector is internationalised.. The trade unionism of many developing countries may lead to endogenous urban formal wage rate.We also observe in many developing countries that the products of the urban informal sector are also globally traded.2 Our main finding is that subsidies given to the urban informal sector lowers urban unemployment and raises domestic factor income.The result provides adequate basis for Governments' subsidization program for the urban informal sector. At present, this is very important when global tendency runs against subsidies

Section 2 develops the model and gives the results. Section 3 concludes.

2. THE MODEL

We consider a small open economy consisting of three sectors: urban formal sector(u), urban informal sector (i) and rural sector (r). The goods produced in the three sectors

are internationally traded and their prices are exogenously given.The production functions of all the three sectors satisfy constant returns to scale. All the three sectors use labour and capital as inputs. Capital is measured in physical unit while labour is measured in efficiency unit. The intensive production functions of the three sectors are given by:

$X_u = L_u f_u (k_u)$ …….(1)

$X_i = L_i f_i(k_i, h)$ …….(2); and

$X_r = L_r f_r (k_r)$ …….(3).

Where Xj is the level of output of the jth sector,Lj is the level of employment in the jth sector ,kj is the capital intensity of the jth sector and h is the worker's efficiency. Worker's efficiency depends upon the wage rate they receive. Higher wage implies larger efficiency of the worker and such efficiency-wage relation is more pronounced in the low wage level. It is assumed that the worker's efficiency is equal to unity above a certain level of wage (W*); and both the urban formal wage rate and the rural wage rate are higher than this level in the initial equilibrium. Thus, worker's efficiency is equal to one for both the rural sector and the urban formal sector and hence are independent of the wage rates there. However, for the urban informal sector, the wage rate is very low and is less than that level in the initial equilibrium. So the labour efficiency there is positive but less than unity. Also this efficiency varies positively with the wage rate in the informal sector. The efficiency wage relation in the informal sector is given by:

$h = h (W_i)$ ……(4)

Following restrictions are imposed on this efficiency function :

(I) $h'(W_i) > 0$ for $W_i < W^*$; (II) $h(W_i) = 1$ for $W_i > W^*$.

All the market are assumed to be perfectly competitive and the representative firm is assumed to maximise profit. CRS property of the production function and the equilibrium of a competitive firm implies the equality between the price and the unit cost. Profit maximisation in the informal sector also implies the minimisation of cost of one efficiency unit of labour. The long run equilibrium of a competitive firm implies that price is equal to the unit cost. Hence we have the following equations :

$P_u = C_u (W_u, R)$ …(5);

$P_i = C_i (V_i.R)$ …(6); and

$P_r = Cr (W_r, R)$ …(7).

Where Pj is the producer's effective price of the jth good, Wj is the wage rate in the jth sector,R is therental rate on capital, Vi is the cost of one efficiency unit of labour in the urban informal sector, Cj is the unit cost of production of the jth sector.3

The cost of one efficiency unit of labour in the urban informal sector is given by:

$V_i = (W_i / h(W_i)$ …(8).

The condition for minimisation of unit cost of labour (expressed in efficiency unit) is given by

$(h'(W_i) W_i / h(W_i)) = 1$ …(9)

Workers migrate form the rural region to the urban region; and a fraction of the urban labour force remains unemployed. The migration mechanism is of Harris-Todaro (1970) type. Thus, the labour market equilibrium is given by the equality between the actual rural wage rate and the expected urban wage rate. The Harris-Todaro (1970) migration equilibrium condition is given by the following equation :

$W_r = W_u (L_u/ (L-L_r)) + W_i (L_i / (L-L_r))$ … (10),

where L is the total labour endowment of the entire economy,Lj is the level of employment in the jth sector.We assume that the total amount of capital stock (K_D) and the size of labour force are given. Capital is fully employed. However, there exists open unemployment of labour in the urban region. Capital is perfectly mobile among the three sectors 4 . Thus, we have a common rate of return on capital in all the three sectors. The full utilisation of capital stock leads to the following equation :

$k_uL_u + k_iL_i + k_rL_r = K$ …(11)

It is assumed that the urban formal sector is more capital intensive than the rural sector in value terms .

The level of urban unemployment(U) is given by :

$U = L-L_u-L_i-L_r$ (12)

The total factor income(Y) of the economy is given by

$Y = W_uL_u + W_iL_i + W_rL_r + RK$ … (13)

And is equal to the national income in the absence of any tax or subsidy imposed on factor income. Using Equations "(10)" and "(13)" we get,

$Y = W_rL + RK$ … (13a)

urban formal sector's wage rate is assumed to be endogenous. Urban formal wage rate is positively associated with the urban informal wage rate and the rural wage rate and is

inversely related to the urban unemployment. Thus , the urban formal wage function is given by :

$W_u = W_u (W_i , W_r , U)$ … (14)

Where $(\delta W_u / \delta W_j) > 0$ for $j = i , r$ and $(\delta Wu / \delta U) < 0$.

We follow Khan (1980) to justify the equation "(13.1)"with the help of Calvo (1978) and Stiglitz (1974). Calvo (1978) has emphasised the role of trade unions in the determination of urban formal wage rate. Calvo (1978) assumes that trade unions' utility depends on the wages received by their members and on the alternative sources of employment. Thus, if we assume that labourers in the urban formal sector are unionised the increase in rural wage rate, W_r (urban informal wage rate , W_i) makes rural employment (urban informal sector's employment) more attractive to the trade union members. As a result , the utility of the trade union falls. Hence , the trade union demands higher urban formal wage rate , W_u , to maintain the same level of utility . The effect of urban unemployment on urban formal wage rate can be explained in terms of the labour turn – over model of Stiglitz (1974) . Stiglitz (1974) has shown that , as unemployment falls , it becomes easier for the workers to quit and take other jobs. Thus the quit rate rises ; and this raises the cost of recruitment of new workers and the indirect training cost of labour. To combat these increases , firms must pay higher urban wage when quit rate rises due to the reduction in urban unemployment. Thus , urban formal wage rate and urban unemployment vary inversely.This completes the equational structure of the model.

Equation "(9)" yields equilibrium value of W_i . Then Equation "(8)" determines the value of V_i and Equation "(4)" determines the value of h . We get the value of R from Equation "(6)" , given P_i and v_i . Equation "(7)" yields the value of W_r , given Pr and R. Equation "(5)" determines W_u , given P_u and R . Thus , we get the values of k_u , k_i and k_r from the Equations "(14)" , "(15)" and "(16)" . We can solve for equilibrium value of U from Equation "(13.1)" , given W_u , W_i and W_r . The levels of employment in the three sectors L_u , L_i and L_r are obtained solving Equations "(10)","(11)" and "(12)" simultaneously. Finally , we get the value of Y from Equation "(14a)".

3.COMPARATIVE STATIC EFFECTS

Suppose that P_i is raised due to subsidization to the informal sector. Then Equation "(6)" shows that R will rise , given V_i . Then W_r and W_u will fall , given P_r and P_u (see

Equations "(5)" and "(7))". Thus , k_u, k_i and k_r will fall. Equation "(11)" shows that (L_u + L_i + L_r) will rise, given K_D . Hence , U must fall to satisfy the Equation "(12)" . However, the Appendix shows that L_u , L_i and L_r may move in any direction .From Equation "(13a)" we can show that Y will rise if the fall in W_rL isless than the rise in RK ; and this is satisfied if (dw_r / dR) < - (K/L) ; or if k_r < (K/L) .Thus, we get the following proposition:

Proposition : A rise in P_i resulting from subsidization to the informal sector lowers unemployment; and raises the total factor income if the rural sector is sufficiently labour-intensive. However, the effect on the informal sector's employment is indeterminate.

So, subsidization to the informal sector raises total factor income; and hence national income may also improve even if the subsidy is financed by taxing the factor income. Such a strong positive argument for subsidization to the informal sector is not available in the existing theoretical literature.

4.CONCLUSIONS

The paper has examined the impact of output subsidy given to the informal sector on urban unemployment, informal sector's employment and on the domestic factor income of a small open economy where capital is perfectly mobile among the three sectors. The simultaneous existence of urban informal sector and urban unemployment has been explained interms of efficiency wage theory which is applicable to the low wage informal sector. Informal sector also produces traded goods and the presence of trade union in the urban formal sector makes the formal wage endogenous.This is highly observed in many developing countries like India where handloom and handicraft products are internationally traded and the trade union activities are flashing.

Output subsidy given to the urban informal sector lowers urban unemployment and raises domestic factor income provided that the rural sector is sufficiently labour intensive. Its effects on informal sector's employment is ambiguous.

ENDNOTES

1. Fields(1989) explains this in terms of job searching and Gupta(1993) explains this in terms of agricultural surplus whose price is fixed.
2. The assumption that the urban informal sector produces internationally traded good has been found in the models of Grinols(1991),Chandra and Khan(1991) and Gupta(1997).

3. The unit cost function,Cj(.) has three basic properties: it is negatively sloped and its slope is equal to –Kj/Lj , it is concave and it is linearly homogenous in factor prices(see Khan and Naqvi,1983).
4. We find this type of capital mobility in Chandra and Khan(1993).

Appendix

The total differentials of Equations (10),(11) and (12) are given by:

WudLu +WidLi +WrdLr = (L- Lr)dWr – LidWi – LudWu ……..(15);

kudLu + kidLi +krdLr = dK –Lu dku –Li dki –Lr dkr ……(16); and

dLu +dLi + dLr = --dU …… (17).

The matrix form of these equations is :

$$\begin{bmatrix} W_u & W_i & W_r \\ K_u & K_i & K_r \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} dL_u \\ dL_i \\ dL_r \end{bmatrix} = \begin{bmatrix} (L\ Lr)\ dWr\ \ Li\ dWi\ Lu\ dWu \\ dK\ Lu\ dku\ Lidki\ Lr\ dkr \\ -\ -dU \end{bmatrix}$$

Let D be the determinant of the co-efficient matrix of the endogenous variables in the system. So,we can write,

D = (Wr –Wi) ku -(Wu – Wi)kr + (Wu – Wr) ki

If ku > ((Wu- Wi)/(Wr –Wi))kr, then, D >0

Hence, dLu = 1/D(((L –Lr) dWr –Li dWi – Lu dWu) (ki –kr) –(dK –Lu dku –Li dki –

Lrdkr) (Wi –Wr) – dU (Wi kr –Wr ki))……(A.1)

dLi = 1/D (((dK – Lu dku –Li dki –Lr dkr)(Wu –Wr) + (Wukr –Wrku) dU –

((L –Lr) dWr –LidWi –Lu dWu) (ku –kr)……(A.2)

dLr = 1/D (((L –Lr) dWr -- Li dWi –LudWu) –(dK – Ludku –Lidki –

Lrdkr)(Wu –Wi) + (Wiku – Wuki) dU)…….(A.3)

Effect of a change in Pi

Put dWi =dK =0 in the expressions (A.1), (A.2) and (A.3) and we get,

$$dLu/dWr = 1/D\,(((L - Lr) - Lu(dWu/dWr))(ki - kr) + (Lu\,dku/dWr + Li\,dki/dWr + Lr(dkr/dWr))(Wi - Wr) - (Wikr - Wrki)\,dU/dWr) \gtrless 0$$

$$dLi/dWr = 1/D\,(((-Lu(dku/dWr) + Li(dki/dWr) + Lr(dkr/dWr))(Wu - Wr) + (Wukr - Wrku)(dU/dWr) - ((L - Lr) - Lu(dWu/dWr))(ku - kr)) \gtrless 0$$

$$\text{And } (dLr/dWr) = 1/D(((L - Lr) - Lu(dWu/dWr))(ku - kr) + (Lu(dku/dWr) + Li(dki/dWr) + Lr(dkr/dWr))(Wu - Wi) + (Wiku - Wuki)\,dU/dWr) \gtrless 0$$

Now, $(dLj/dPi) = (dLj/dWr)(dWr/dPi)$ for j = u,i and r.

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