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Notes

INTERNATIONAL MIGRATION AND WELFARE: A NOTE

Manash Ranjan GUPTA

Abstract: The effect of international migration on the welfare of the non-migrants has been analysed in a two-sector dual economy model with Harris-Todaro type of rural-urban migration. It is shown that the emigration to the foreign country worsens the income distribution and hence lowers the welfare of the non-migrants.

There exists a recent theoretical literature on the effect of international migration from a less developed country on the welfare of the non-migrants in that country. The traditional result in the literature is that, in a two-product small open economy, any given amount of emigration does not affect the welfare of the non-migrants because the presence or the absence of the migrant group in the population implies the same terms of trade, and hence the same trade opportunity for the non-migrants.[1] The recent literature[2] on this issue has been developed with the assumption that one of the two commodities is internationally non-traded. Rivera-Batiz (1982) has shown that the emigration, if it is from the non-traded goods sector, reduces the 'exchange opportunities' the non-migrants have under the presence (and with) the migrants, in terms of the exchange of traded for non-traded goods. Relative price of the non-traded goods goes up and this adverse terms of trade lowers the welfare of the non-migrants. But Quibria (1988) has shown that if the international migration of labour is not accompanied by any movement of capital then per-capita availability of capital for the non-migrant labour force also rises. This produces a positive income-effect. If the positive income effect dominates the adverse terms of trade effect, the effect on welfare is exactly opposite to that what Rivera-Batiz (1982) finds.

However, the analysis (in the existing literature) has been made in the standard neo-classical framework characterized by flexibility of factor prices and the full-employment of resources-labour and capital. However, a less-developed economy is characterized by a large volume of unemployment and a substantial degree of inequality in the distribution of income. Migration from the less-developed country results in an increase in the degree of inequality in the distribution of income of the non-migrants. However, the analysis in the existing

* Helpful comments have been received from Prof. D. Dasgupta, Professor S. Roy and an anonymous referee of the Journal. Remaining errors are solely mine.

[1] See Bhagwati and Rodrigues (1976).

[2] It includes Rivera Batiz (1982), (1984), Thompson (1984), Djajic (1986), Quibria (1988).

literature can not focus on this point.

In this, paper, we consider a dual economy model characterized by rural-urban wage-gap and Harris-Todaro (1970) type of internal (rural-urban) migration and urban unemployment. Due to this rural-urban wage-gap and urban unemployment, there exists a positive degree of inequality in the distribution of wage-income. International migration from the urban sector creates employment opportunities there. This leads to an increase in the volume of rural-urban migration and urban unemployment; and hence worsens the income distribution of the workers. This is independent of whether one commodity is internationally non-traded or not. So we assume that both the goods are internationally traded.

2. THE MODEL

We consider that the economy under consideration is a small open one with two sectors-urban and rural. The two sectors produce two different commodities and prices of both these two are internationally given. The urban sector produces the product with capital and labour as inputs using a fixed coefficient production function.[3] It is assumed that one unit of capital can employ one worker in the urban sector. Labour is the only factor of production in the rural sector. We also consider two kinds of labour force. One type of labour force has its origin in the urban sector. It has access to international migration. Workers belonging to this group either work in the urban sector or leave the country. The other type of labour force has its origin in the rural sector and it does not have any access to international migration.[4] However, a part of this labour force migrates to the urban sector. Workers with urban origin are first recruited in the urban sector.[5] Rest of the urban vacancies are filled up by the workers migrating from the rural sector. There is rural-urban wage-gap and the rural-urban migration mechanism is of Harris-Todaro (1970) type. For the sake of simplicity, wage-rates in both the two sectore are assumed to be fixed. The two types of labourers are not distinguished from the view-point of skill, and hence the workers with urban origin and the rural migrants receive the same wage-rate in the urban sector. Since it is a static model, we consider the size of the capital-stock and the size of two types of labour force as given.

Following notations will be used in this paper.

K = Given capital stock in the urban sector.

S = Given labour-force with urban origin.

L = Given labour-force with rural origin.

$q = S/L$

[3] A fixed-coefficient production function is not necessary. Given the wage-rate and a neo-classical production function satisfying CRS, the optimum capital-labour ratio is fixed.

[4] It may be due to high cost of immigration or lack of information of the jobs in the foreign countries.

[5] Since the workers with urban origin are better informed of the vacanicies created in the urban sector than the workers with rural origin, they are in a relatively advantageous position in getting high wage urban jobs.

λ = Fraction of S leaving the Country
W_1 = Urban wage-rate
W_2 = Rural wage-rate
Y = per capita income of the non-migrants
G = Gini-coefficient of the income-distribution of the non-migrants.
L_1 = No. of L-type workers working in the urban sector.
L_2 = No. of L-type workers working in the rural sector.
L_u = No. of L-type workers remaining unemployed in the urban sector.
U = Level of welfare of the non-migrants.
P = Relative price of rural sector's product in terms of the urban sector's product.

Since one unit of capital can employ one worker in the urban sector, K stands for the employment opportunities in the urban sector. Also $(1-\lambda)$. S is the S-type workers working in the urban sector. We assume that $K>(1-\lambda)S$; and hence $(K-(1-\lambda)S)$ vacancies in the urban sector are open to the rural migrants. So we have

$$L_1 = K-(1-\lambda)S\,. \tag{1}$$

Since L_1 rural migrants get jobs in the urban sector and (L_1+L_u) rural migrants compete for the urban jobs, $(L_1/(L_1+L_u))$ is the probability of the representative rural migrant getting an urban job. Since W_1 is the actual urban wage-rate, $(W_1L_1/(L_1+L_u))$ is the expected urban wage-rate of the rural migrant. Rural-urban migration continues so long as $(W_1L_1/(L_1+L_u))>W_2P$; and the reverse migration takes place when $(W_1L_1/(L_1+L_u))<W_2P$. In migration-equilibrium,

$$(W_1L_1/(L_1+L_u))=W_2P\,. \tag{2}$$

and this is the Harris-Todaro (1970) migration equilibrium condition.

We put $L=1$ as a normalizing condition. Hence,

$$L_1+L_u+L_2=1 \tag{3}$$

and then equation (1) can be expressed as

$$L_1 = K-(1-\lambda)q\,. \tag{1A}$$

K and q are given. So given a value of λ, we can obtain the equilibrium values of L_1, L_2 and L_u solving equations (1A), (2) and (3). We now examine the effect of a change in λ on L_1, L_2 and L_u.

From equation (1A), we have,

$$dL_1/\mathrm{d}\lambda = q>0\,.$$

Hence an increase in the proportion of S-type labour force migrating to the foreign country raises the number of L-type workers in the urban sector. Using equations (2), we have,

$$L_u=((W_1/W_2P)-1)L_1\,. \tag{4}$$

By assumption, $W_1 > W_2P$. Hence if $L_1 > 0$, then $L_u > 0$. Also an increase in λ raises L_u. So with increase in migration to the foreign country level of urban unemployment rises. From equation (3), it is now obvious that, with the increase in the proportion of S-type of labour force migrating to the foreign country, level of rural employment falls.

3. WELFARE OF THE NON-MIGRANTS

Since $L=1$ and $S=q$, the size of the non-migrant workers is given by $((1-\lambda)q+1)$. The per-capita income of the non-migrant workers is given by

$$Y=\frac{W_1(1-\lambda)q+W_1L_1+PW_2L_2}{(1-\lambda)q+1} \qquad .(5)$$

Using equations (2), and (3), we have

$$W_1L_1+PW_2L_2=W_2P \qquad (6)$$

and hence using equations (5) and (6), we have,

$$Y=\frac{W_1(1-\lambda)q+W_2P}{(1-\lambda)q+1}. \qquad (5A)$$

Since $W_1 > W_2P$, it is obvious that an increase in λ lowers the numerator at a higher rate than the denominator. Hence Y falls as λ rises. This leads to the following proposition.

PROPOSITION 1. *As the proportion of S-type labour force migrating to the foreign country rises, per capita income of the non-migrants falls.*

Next we look at the income-distribution of the non-migrant workers. There are three different income-groups within the working class in a Harris-Todaro type of model in the presence of a rural urban wage-gap. They are: (i) the urban workers who earn a high wage rate; (ii) the rural workers who earn a relatively lower but positive wage-rate; and (iii) the unemployed workers in the urban sector who do not earn anything. Hence there is a positive degree of inequality of income of the labourers. So the Gini-coefficient, G, is positive. This income distribution of the non-migrant is shown below:

Income (wage):	W_1	W_2	0
No. of Workers:	K	L_2	L_u

Note that K is independent of λ. But with increase in λ, L_u rises and L_2 falls. Hence it is obvious that an increase in λ raises the value of G—the Gini-coefficient of the income-distribution of the non-migrant workers. This leads to the following proposition.

PROPOSITION 2. *The higher the proportion of S-type of labour force migrating to the foreign country, the greater will be the Gini-coefficient of the income-distribution*

of the non-migrant workers.

Now we examine the effect of a change in λ on the welfare of the non-migrant workers. The welfare of the non-migrants should be defined as a positive function of their per-capita income, and a negative function of the Gini-coefficient of the distribution of income. We consider the welfare measures suggested by Sen (1974) and Kakwani (1980); and those are given by the following:

$$U = Y(1-G)\,, \tag{6}$$

and

$$U = \frac{Y}{1+G}\,. \tag{6A}$$

Now using propositions 1 and 2, we can easily prove the following.

PROPOSITION 3. *The higher the proportion of S-type of labour force migrating to the foreign country, the lower will be the level of welfare of the non-migrants.*

4. EXTENSION[6]

One restrictive assumption of the basic model is that the wage-rate of each sector is exogeneously given in terms of its own product. In this section, we attempt to study the implication of an alternative assumption that the rural wage rate is set equal to the average (or, marginal) product of labour in the rural sector subject to the law of diminishing marginal and average productivity of labour and the urban wage-rate is determined as an increasing function of the rural wage rate.

In this case we have the following additional equations:

$$W_2 = W_2(L_2) \qquad \text{with} \quad W_2'(L_2) < 0\,;$$

$$W_1 = \beta \cdot W_2 \cdot P$$

where $\beta > 1$ and is a constant.[7]

Hence equation (4) can be written as

$$L_u = (\beta - 1)L_1\,; \tag{4A}$$

and then

$$L_2 = 1 - \beta L_1\,.$$

Since $(dL_1/d\lambda) = q$, then $(dL_2/d\lambda) = -\beta \cdot q$ and hence $(dW_2/d\lambda) = W_2'(L_2)(dL_2/d\lambda) = -W_2'(L_2) \cdot \beta \cdot q > 0$. This leads to the following proposition.

PROPOSITION 4. *The higher the proportion of S-type of labour force migrating to the foreign country, the higher will be the rural wage-rate.*

[6] This section is the result of the suggestions of an anonymous referee of this journal.

[7] For the sake of mathematical simplicity, it is assumed that W_1 is a linear increasing function of W_2.

Equation (5A) can be written as

$$Y=\frac{W_2P(\beta(1-\lambda)q+1)}{(1-\lambda)q+1}. \tag{5B}$$

Note that when λ rises, W_2 rises. But

$$\frac{\beta(1-\lambda)q+1}{(1-\lambda)q+1}$$

falls as λ rises because $\beta>1$. So the effect of an increase in λ on the per-capita income, Y, is indeterminate. It can be shown that

$$(dY/d\lambda)=-\frac{P_0g}{((1-\lambda)q+1)}\left[W_2'(L_2)\beta(\beta(1-\lambda)+1)+\frac{W_2(\beta-1)}{((1-\lambda)q+1)}\right].$$

Here,

$$(dY/d\lambda)\gtreqless 0$$

if

$$(\beta(1-\lambda)+1)((1-\lambda)q+1)\lesseqgtr -\frac{W_2(\beta-1)}{W_2'(L_2)\beta}$$

or,

$$G(\lambda)\lesseqgtr((\Theta\cdot L_2(\beta-1))/\beta)$$

where,

$$\Theta=-\frac{W_2}{W_2'(L_2)\cdot L_2}>0$$

is the wage-elasticity of employment in the rural sector; and $G(\lambda)=(\beta(1-\lambda)+1)((1-\lambda)+1)$.

Here $G(\lambda)$ is a negative function of λ with the following properties: $G(1)=1$ and $G(0)=2(\beta+1)$. Note that $L_2\leq 1$. This is guaranteed by equation (3) because $L_1\geq 0$ and $L_u\geq 0$. If we assume that Θ is a constant and $\Theta<(\beta/(\beta-1))$, then for any λ, satisfying $0\leq\lambda\leq 1$, we have, $G(\lambda)>((\Theta L_2(\beta-1))/\beta)$ and hence, $(dY/d\lambda)<0$. So the Proposition 1 remains valid even in this extended model if $\Theta<(\beta/(\beta-1))$.

Now looking at the income-distribution of the non-migrant, we find that an increase in λ raises L_u and lowers. L_2. But W_2 rises. Hence $W_1=\beta W_2$ also rises. So the negative effect of a rise in L_u and a fall in L_2 on the income-distribution is accompanied by the positive effect of the increases in W_2 and W_1. So the value of G—the Gini-coefficient of the income-distribution—is not necessarily reduced.

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