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Migration, Urban-Unemployment and Development* Part 1-A Survey

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Migration, Urban-Unemployment and Development*

Part I—A Survey

Hiroshi Kakazu

W. Arthur Lewis' [12] [13] development theory of unlimited supply of labour stirred and dominated the development theorists in the 1950s through the early 1960s. Numerous theoretical and empirical studies have undertaken based primarily upon the Lewis model. On the other hand, the validity of the Lewis model has been challenged by notable development theorists particularly since the late 1960s.

The Lewis model contains serious deficiencies in the light of contemporary development problems of the underdeveloped rural economies. Lewis' critics, however, very often have misunderstood the essence of the Lewis model and they failed to present an effective alternative approach to the Lewis model.

In this paper, I shall first make a brief survey of the Lewis model and its development focusing mainly on migration from the subsistence agricultural sector to the urban modern sector. Second, (in Part II), an alternative approach to the Lewis model will be suggested.

I The Lewis-Fei-Ranis (L-F-R) Model

The Lewis model is conventionally called as "the Lewis-Fei-Ranis model" honouring significant improvements and extensions of the model by Fei and Ranis [7] [8]. The Lewis model consists of two sectors: (a) the modern capitalist sector where profits are accumulated and invested into productive facilities and (b) the traditional subsistence sector characterized

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by high population pressure and surplus labor or disguised unemployment whose marginal productivity is negligible, zero, or even negative [12, p. 402].

The essence of the Lewis model of economic development is well illustrated by Diagram 1.

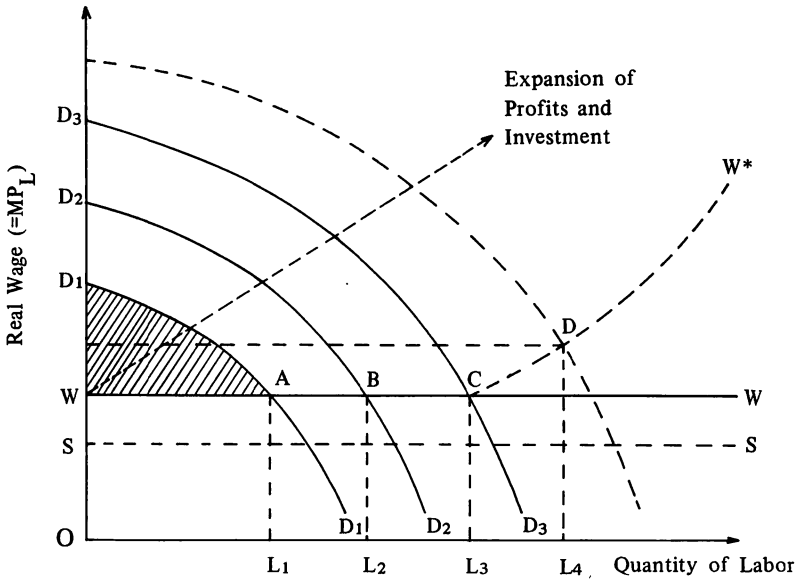


Diagram 1

On the vertical axis we have the real wage and the marginal product of labor (MP_L) and on the horizontal axis the quantity of labor. The wage level (WW) in the modern sector is determined as a fixed premium over the subsistence wage level (SS) of the traditional sector, and it is constant as long as the transferable surplus labor exists in the traditional sector. The employment level (L) in the modern sector is determined at the intersection of wage level and demand for labor (DD) which is in turn determined by

marginal product of labor. Since the supply of labor is unlimited at the constant wage rate, we can say that the level of employment is determined by the schedule of marginal product of labor. Thus, given D_1D_1 schedule, the modern sector's employed labor is OL_1 , with which OD_1AL , income will be generated. Of the initial total income, the shaded area (WD_1A) will be retained as profits for reinvestment and $OWAL_1$ is paid as wages. From here, the economic development proceeds almost automatically as is depicted in Diagram 1. Profit reinvestments will increase the productivity thereby shifting the DD schedules to the right (from $D_1D_1 \rightarrow D_2D_2 \rightarrow D_3D_3$ and so on.) The wage level will be constant until the surplus labor is exhausted at L_3 ; beyond this level, labor becomes relatively scarce so that further expansion of the modern sector will necessarily increase the real wage rate as suggested by $W W$.*

A major drawback of the Lewis model is its failure to analyze the interaction between the subsistence or agricultural sector and the modern or industrial sector and to present the necessary conditions of the former sector for the take-off process. The Fei and Ranis model substantially improved the Lewis model by formulating a balanced growth model between the agricultural sector and the industrial sector.

The Fei-Ranis model will be best described by using their diagrams as follows: Diagram 2.1 depicts the development process of the industrial sector and Diagrams 2.2 and 2.3 the agricultural sector. Diagram 2.1 is similar to that of Diagram 1 of the Lewis model. The unlimited supply curve of labor is defined by the horizontal portion of the supply curve, i.e. St . This portion of the labor supply curve corresponds to the zero marginal physical productivity (MPP) portion (AD) of the MPP curve (AUV) of the agricultural sector depicted in Diagram 2.2. AUV and SYZO curves in

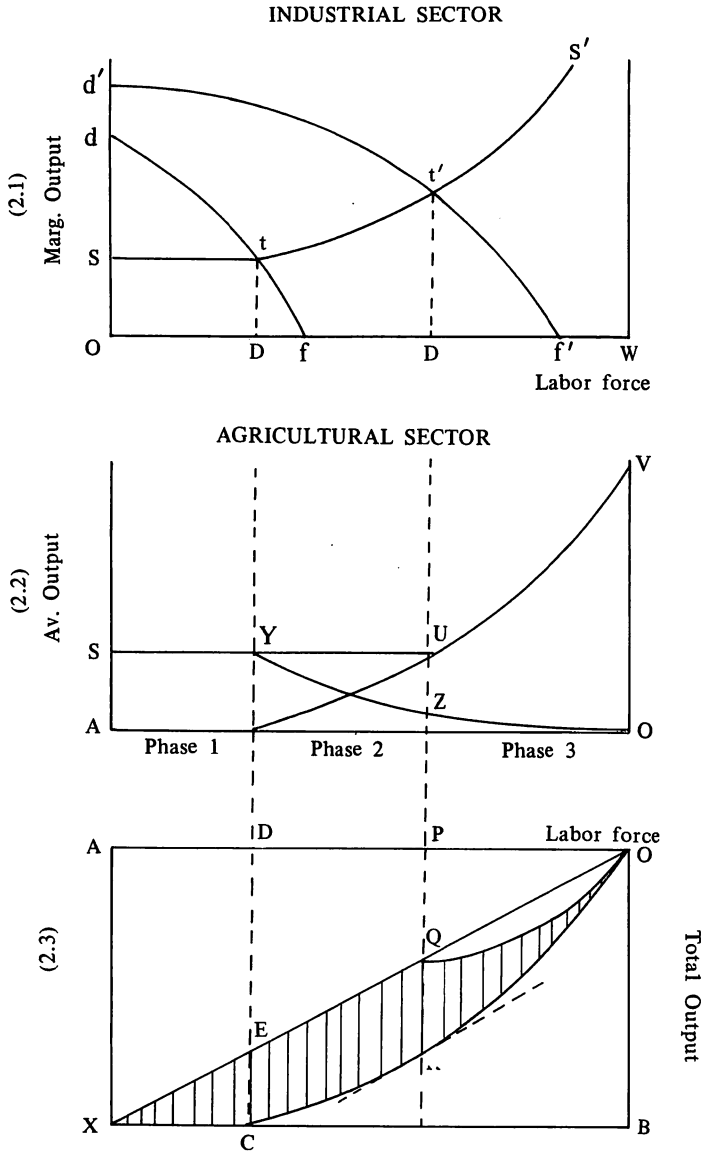


Diagram 2.2 are derived from Diagram 2.3.

In Diagram 2.3 the agricultural labor force is measured on the horizontal axis (reading from O to A), and the agricultural total output is measured on the vertical axis (O to B). The curve ORCX depicts the total physical productivity (TPP) of the agricultural sector. The tangential line to TPP is MPP which is increasing at the initial stage and then decreasing to be the zero at point C where the agricultural labor force becomes redundant.

In Diagram 2.3 AD portion of the total labor force is redundant which corresponds to phase 1 of Diagram 2.2. The subsistence or real wage, which is determined by institutional or nonmarket forces, is equal to AX/OA when the entire labor force OA is committed to producing agricultural output of AX. Or it can be expressed as the slope of OX which is constant for the portion of PA corresponding to the constant portion of agricultural wage (SU) in Diagram 2.2. At P, institutionally determined wage will be equal to the MPP, i.e. the tangential line at R is paralleled to OX. The difference between TPP and the total real wage (= total consumption) is assumed to be the total agricultural surplus (TAS) which will be used to support the industrial workers transferred from the agricultural sector. The shaded area indicates TAS at respective quantity of labor force. For example, the size of TAS is EC at D.

TAS may be viewed as agricultural resources released to the market through the re-allocation of agricultural workers. Such resources can be siphoned off by means of the investment activities of the landlord class and/or government tax policy and can be utilized in support of the new industrial arrivals [7, p.538].

The SYZO curve in Diagram 2.2 represents the average agricultural surplus (AAS) which is defined as TAS divided by the total industrial workers transferred from the agricultural sector. In phase 1, the AAS curve coincides with the institutional wage curve SY since TAS increases linearly with the transfer of the redundant labor force from A to D. In phase 2, however, MPP is positive, so that each withdrawal of agricultural worker will reduce TAP and also AAS though TAS is still rising up to P. In phase 3, TAS begins to fall leading to more rapid decline of AAS.

It is clear from Diagram 2.2 that each agricultural worker, from A to P, is disguisedly unemployed because his MPP is less than his wage (AS) which is determined by nonmarket forces. Beyond P, which is termed as the “commercialization point”, agricultural wage is fully determined by competitive market forces.

It should be noted that the real wage of the industrial sector is determined by demand for and supply of labor in the competitive market. Since the industrial labor force comes from the agricultural surplus labor in the initial stage of development, the labor supply curve is constant from O to D of Diagram 2.1 reflecting the redundant labor force in the agricultural sector in phase 1. After the disappearance of the redundant labor force, the industrial labor supply curve turns up (i.e. the Lewis turning point occurs) due to a deterioration of the terms of trade of the industrial sector which are reflected in the declining AAS in Diagram 2.2 and a rise in the industrial real wage measured in terms of industrial goods.

According to the Fei-Ranis model, the economic development of the developing countries, particularly those of overpopulated and resource poor countries, will be most effectively conducted in a balanced-growth fashion between the subsistence agricultural sector and the modern industrial sector

by utilizing the agricultural surplus labor. Indeed, the surplus labor provides 'concealed savings' which can be used to promote economic development in a costless way [17, p. 68].

The Fei-Ranis model's major contributions to the development literature are (1) a rigorous formulation of the concept that the overall growth rate of a (closed) economy cannot be sustained without a simultaneous expansion of its slowest developing sector — agriculture, and (2) the agricultural surplus labor can be considered not as a burden to the economic development but as a form of saving which can be used for transforming the subsistence economy into the modern industrialized one.

II Criticisms of the L-F-R Model

Many criticisms have been raised against the L-F-R type of disguised unemployment. First, Myint [17, pp. 109-110] argues that the theory based upon a misconceived assumption that the surplus labor can be transferred from the agricultural sector into the industrial sector without reducing the total agricultural output. This misconception arises from the theory's failure to distinguish between the zero marginal product of a unit of labour and the zero marginal product of a worker [20]. In the underdeveloped subsistence sector, where work sharings are common practice, the marginal product of a worker is substantially greater than zero. Therefore, in order to keep the total agricultural output remained constant after removing the so-called surplus labor, the remaining agricultural workers work harder than before to offset the reduced output. But for this, 'there will have to be a considerable amount of reorganization and provision of economic incentives' [17, p. 69].

Second, Torado [24, p. 190] criticizes the model's implicit assumption

that the rate of labor transfer and employment creation in the industrial sector proceeds in proportion to the rate of capital accumulation in the industrial sector. That is to say, the capital intensity of production remains unchanged throughout the development process. There are, however, mounting evidences to suggest that the industrial development in many underdeveloped countries has taken place to the direction of more and more capital intensive way [15] [16] [17] [18].

As is depicted in Diagram 3, if the labor demand curves shift outward from D_1D_1 to D_2D_2 in the Lewis model as the result of capital reinvestment with improved technologies, total wages (OWAL) and employment (OL) remain unchanged though total output has increased substantially from OD_1AL to OD_2AL .

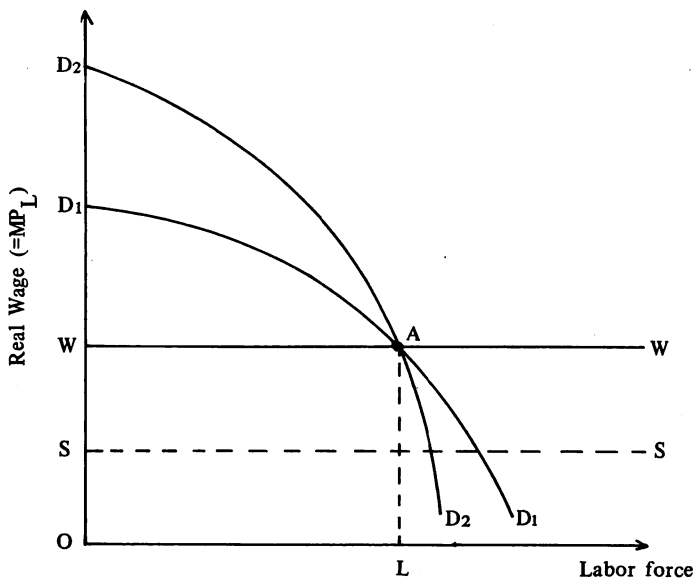


Diagram 3

Third, the theory assumes that there is full employment in the modern industrial sector in spite of the continuous transfer of the agricultural surplus labor. This assumption is also at variance with reality.

. . . most underdeveloped countries are now expanding the process by which the migration of laborer from agriculture to manufacturing industry has converted the 'disguised unemployment' of the rural areas into the open unemployment in the chancy towns around the big cities [24, p. 73].

Today also concludes that

when one takes into account the labor-saving bias of most modern technological transfer, the wide-spread-non-existence of rural surplus labor, the growing prevalence of 'urban surplus' labor, and the tendency for urban wages to rise rapidly even where substantial urban open unemployment exists, then the Lewis-Fei-Ranis model can be seen to offer little analytical and policy guidance for solving Third World employment and migration problems [24, p. 191].

The rates of open unemployment in the cities of less developed countries vary substantially as are shown in Table 1.

Table 1 RATES OF URBAN UNEMPLOYMENT BY AGE

	15-24	15 and over
Ghana, 1960 Large towns	21.9	11.6
Bogota, Colombia, 1968	23.1	13.6
Bueons Aires Argentina, 1965	6.3 ¹	4.2 ²
Chile, 1968 Urban areas	12	6 ³
Caracas, 1966	37.7	18.8
Guyana, 1965 Mainly urban areas	40.4	21.0 ⁴
Panama, 1963/64 Urban areas	17.9 ⁵	10.4
Uruguay, 1963 Mainly urban	18.5	11.8
Venezuela, 1969 Urban areas	14.8	7.9
Bangkok, Thailand, 1966	7.7	3.4
Ceylon, 1968 Urban areas	39.0	15.0
India, 1961/62 Urban areas	8.0	3.2 ⁶
Korea, 1966 Non-farm households	23.6	12.6
Malaya, 1965 Urban areas	21.0	9.8
Philippines, 1965 Urban areas	20.6 ⁷	11.6 ⁸
Singapore, 1966	15.7 ⁹	9.2
Tehran City, Iran, 1966	9.4	4.6

SOURCE: E.O. Edwards [5, p. 13].

NOTES: 1. 14-29 age group 4. over 14 age group 7. 10-24 age group
 2. 14 plus age group 5. 15-29 age group 8. 10 plus age group
 3. 12 plus age group 6. 15-60 age group 9. 15-29 age group

Table 1 shows that the unemployment rates for the young (age 15 to 24) are just about double the rates of unemployment of the whole urban labor force.

III The Torado Model

As we have seen, the L-F-R model implies that the economic development of an over-populated subsistence economy will be best achieved by transferring the disguised unemployment into the industrial sector by means of subsidies, import quota, and other incentives. Lewis [12, p.150]

actually suggests that in order to transfer the redundant labor from the agricultural sector to the industrial sector, the wage level in the latter may require about 30 per cent higher than the former.

The Torado [22] [23] [24] model demonstrates that the labor transfer through the deliberate industrialization created not only urban mass unemployment but also problems of labor shortages in rural areas, particularly during the busy seasons.

The essence of the Torado model will be explained as follows: The model consists of the determination of labor migration from the rural sector to the urban sector and the effect of industrialization or urban unemployment.

A. Determination of labor migration

Migration will take place whenever the discounted present value of the expected 'net' urban-rural income stream over the migrant's time horizon, (V) is greater than zero. Namely,

$$V(0) = \int_{t=0}^n [P(t) Y_u(t) - Y_r(t)] e^{-rt} dt$$

Where $P(t) Y_u(t)$ represents the migrant's expected income stream in period t which is determined by the prevailing income in the urban sector ($Y_u(t)$) and the probability of being employed there ($P(t)$); $Y_r(t)$ the average real incomes of individuals employed in the rural economy; n the number of time periods in the migrant's planning horizon; r the discount rate reflecting the migrant's degree of time preference; and $C(0)$ the cost of migration.

The probability $P(t)$ of having a job in the modern sector within x periods after migration will be defined as follows:

$$P(1) = \pi(1)$$

$$P(2) = \pi(1) + [1 - \pi(1)] \pi(2)$$

$$P(3) = \pi(1) + [1 - \pi(1)] \pi(2) + \{[1 - \pi(1)] - [1 - \pi(1)] \pi(2)\} \pi(3)$$

. . .

$$P(x) = P(x-1) + [1 - P(x-1)] \pi(x)$$

$$\text{or } P(x) = \pi(1) + \sum_{t=2}^x \pi(t) \prod_{s=1}^{t-1} [1 - \pi(s)]$$

Where, $\pi(t)$ the ratio of new job openings relative to the number of accumulated job aspirants in period t .

The model tells us that the migrant's decision to migrate solely depends upon the economic considerations, namely the difference in expected rather than actual earnings between the rural and modern sectors. The migrant workers are assumed to maximize their expected income stream from the migration considering also the migration cost.

B. The effect of industrialization on urban unemployment

The migration theory of (A) is incorporated into a simple aggregate model of urban demand and supply in the following manner.

$$(1) \quad \pi = \frac{\lambda N}{S - N}$$

where π is the probability of obtaining a job in the urban sector, λ is the net rate of urban new job creation, N is the level of urban employment, and S is the total labor force. Therefore, π is directly related to the urban job creation (λN) and inversely related to the level of unemployment.

$$(2) \quad d = W \cdot \pi - r$$

The expected urban-rural real income differential (d) is defined as the difference between the expected urban real wage ($W \cdot \pi$) and the real rural wage (r). Substituting (1) into (2), we get,

$$(3) \quad d = W \left(\frac{\lambda N}{S - N} \right) - r$$

The supply of labor to the urban sector is defined:

$$(4) \quad S = f_s(d)$$

The rate of urban job creation (λ) is assumed to be a function of the urban wage (W) and a policy parameter (a), e.g. a program of import substitution to increase employment, both of which operate on labor demand, we have:

$$(5) \quad f_d(W; a)$$

where it is assumed that $\frac{\partial \lambda}{\partial a} > 0$.

The effect of a import substitution program on the urban labor supply is:

$$(6) \quad \frac{\partial S}{\partial a} = \frac{\partial S}{\partial d} \frac{\partial d}{\partial \lambda} \frac{\partial \lambda}{\partial a}$$

Differentiating (3) with respect to λ , and substituting into (6), we obtain,

$$(7) \quad \frac{\partial S}{\partial a} = \frac{\partial S}{\partial d} W \frac{N}{S - N} \cdot \frac{\partial \lambda}{\partial a}$$

If the increase in labor supply ($\frac{\partial S}{\partial a}$) is greater than the increase in the newly created jobs ($\frac{\partial (\lambda N)}{\partial a}$), the number of urban unemployed will increase, i.e:

$$(8) \quad \frac{\partial S}{\partial a} > \frac{\partial (\lambda N)}{\partial a} = \frac{N \partial \lambda}{\partial a}$$

from (7) and (8), we get,

$$(9) \quad \frac{\partial S}{\partial d} W \frac{N}{S - N} \cdot \frac{\partial \lambda}{\partial a} > \frac{N \partial \lambda}{\partial a}$$

or, multiplying by $\frac{d}{S}$,

$$(10) \quad \frac{\partial S}{\partial d} \Big/ \frac{\partial d}{d} > \frac{d}{W} \cdot \frac{(S - N)}{S}$$

or, substituting (2) into (10), we get following final expression:

$$(11) \quad \frac{\partial S}{S} \Big/ \frac{\partial d}{d} > \frac{W \cdot \pi - r}{W} \cdot \frac{(S - N)}{S}$$

Equation (11) shows that if the elasticity of urban labor supply with respect to the expected urban-rural income differential or what Torado calls the 'migration response function' is greater than the expected urban-rural income differential ($d=w \cdot \pi - r$) as a proportion of the urban wage (W) times the unemployment rate ($\frac{S-N}{S}$), the absolute level of unemployment will rise. It should be noted that the inequality will be satisfied at a very low elasticity of supply.

The Torado model seems to explain the growing urban mass unemployment of most developing nations in the process of industrialization. The model implies that the creation of urban employment through industrialization will widen the expected urban-wage differential and induce even higher rates of labor supply from the rural sector, thereby leading not only to the higher levels of urban unemployment but also to lower levels of rural output and employment.

Bhatia [2] modified and extended the Torado model by allowing flexible work-hours and surplus labor in the rural sector which can be considered more realistic than fixed-hours and non-existence of surplus labor

assumed in the Torado model.

The equilibrium condition of the labor migration from the rural sector to the urban sector can be written as

$$W_A H_A - \frac{V(H_A)}{\alpha} = \rho \left\{ W_M H_M - \frac{V(H_M)}{\alpha} \right\}$$

where W_A , H_A and W_M , H_M denote the wage rate and work hours in the rural and urban sectors respectively; $V(H_A)$ and $V(H_M)$ represent the disutility from labor in the rural and urban sectors respectively; α the constant marginal utility of income which is expressed as

$$\Delta U_M / (W_M H_M - W_A H_A) = \Delta U_A / W_A H_A$$

where ΔU_M is the change in a migrant's utility if he finds a job in the city and ΔU_A is the change in utility if he has to remain unemployed in the urban area.

If the expected urban income of the worker (net of disutility of labor), $\rho \left\{ W_M H_M - \frac{V(H_M)}{\alpha} \right\}$, is greater than his income (net of disutility of work), $W_A H_A - \frac{V(H_A)}{\alpha}$, the migration will take place. The equation shows that the migration may occur even if the expected urban income ($W_M H_M$) is lower than the rural income ($W_A H_A$) whenever the disutility of urban labor is low enough to offset the income difference.

The policy implications of the Bhatia model are mainly two in number: (1) under the flexible work-hours in agriculture, the urban minimum wage might induce more outmigration from rural areas than the Torado model suggested. (2) Measures to reduce disutility of agricultural labor could have the same effect as a production subsidy in stemming migration from the rural to urban sectors. These conclusions are to intensify the results of the Torado model.

IV Criticisms of the Torado Model

Collier [4] revised the Torado model by introducing heterogeneity of the unemployed and the migrants, disaggregating the urban non-wage sector into the activities of casual wage labour, self-employment, and unemployment, and stratifying the unemployed and the migrants by age, sex, and educational characteristics.

Collier's theoretical and empirical conclusions applied to the Tanzanian labor market are the opposite to the Torado's results.

The essence of the Collier model can be explained by using his Diagram as follows:

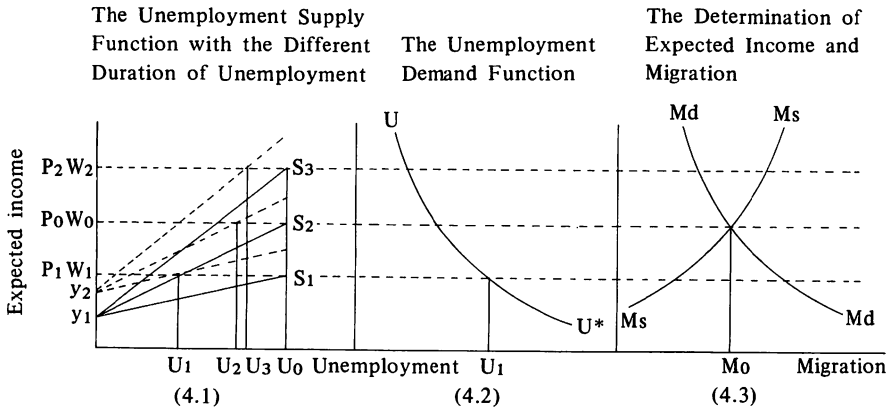


Diagram 4

The unemployment supply function (Y_s) or the opportunity cost of the unemployed in the urban sector, will be the positive function of the urban expected wage (PW). At the equilibrium level of unemployment, the supply price of the unemployed is equal to PW .

An important difference between this model and the Torado model is

that the former's Y_s will rise upward as the unemployed duration of joblessness increases. Diagram 4-1 shows that, given the expected income, the level of unemployment will be reduced from U_0 to U_1 as a result of increase of the initial supply price from Y_1 to Y_2 which is induced by the duration of unemployment. As can be seen from Diagram 4-1, the rate of reduction of the unemployed will be smaller as the slope of the unemployment supply price becomes steeper.

From Diagram 4-1, the unemployment demand function (4-2), which shows the inverse relationship between the expected income and the level of unemployment, will be derived. The unemployment demand function in turn determines the demand for migration function depicted in Diagram 4-3. With the migration supply function, which is the increasing function of the expected income, the equilibrium level of the expected income ($PoWo$) and migration (Mo) are determined as is shown in Diagram 4-3.

The Collier model is a general equilibrium analysis considering both the supply of and demand for migration. On the other hand, the Torado model deals only with the supply side of migration.

Collier analyzed the effects of the various policies of Tanzania on the urban migration. The results are shown in Table 2.

Table 2 shows that the major cause of migration into the urban free-entry sector has been the increase in rural education which has increased the numbers eligible for unskilled wage employment. The increase in urban employment opportunities by 58 per cent, reduced the size of urban migration by 40,000. 'the "Torado-Hypothesis", which predicts that employment expansion will increase the size of the free-entry sector, is therefore found to be false' [4, p.236].

Berry [1] also attacked the Torado hypothesis based upon an empirical

Table 2 **POLICIES WHICH CHANGED THE SIZE OF THE
FREE-ENTRY SECTOR** (urban informal sector)

Policy	Free-entry sector labor force
1. 95 per cent increase in rural education	132,000
2. 4.6 per cent fall in rural incomes	3,000
3. 3.8 per cent increase in urban wage rate	3,000
4. 58 per cent increase in employment opportunities	-40,000
Total increase	98,000

study on colombia. He argues that a great majority of the urban unemployed are relatively well-off city-dwellers who are voluntary unemployed until they can get white-collar jobs. On the other hands, the migrants workers are mostly employed in low-paid blue-collar works which are more readily available than blue-collar ones. Therefore, the natives of the city and migrants are not competing in the urban job market. Furthermore, the Colombia's evidence suggests that if there is a keen job competition in the blue-collar works, migrants are unlikely to flood the market in disregard for relative wages or unemployment since they are not risk takers as Torado [24], Kuznets [10], Schults [19] Falaris [6] and the recent study of Carvajal and Geithman [3] on Costa Rica suggest.

Similar conclusions as Berry's are also found in the studies of Hawley and other [9] on the Malaysian economy.

Tidric's [21] wage-gap model on the Jamaican economy also supports

the job-search theory of urban unemployment. The phenomenon of open unemployment arises 'because their expected lifetime earnings are greater if they remain temporarily unemployed and because they have adequate means of support while searching for a high-wage job' [22, p. 323].

V Leibenstein's X-inefficiency Approach

Leibenstein [11] suggests another interpretation of the urban migration based upon his X-efficiency theory. He argues that Torado's two-gap model of urban migration ignores a good deal of migration which takes place for noneconomic reasons such as the extended family system and lack of motivation to obtain the necessary information.

He argues that 'It would appear difficult to argue on the evidence that individuals are income maximizers in countries where migration is possible and yet income differentials continue' [11, p. 79].

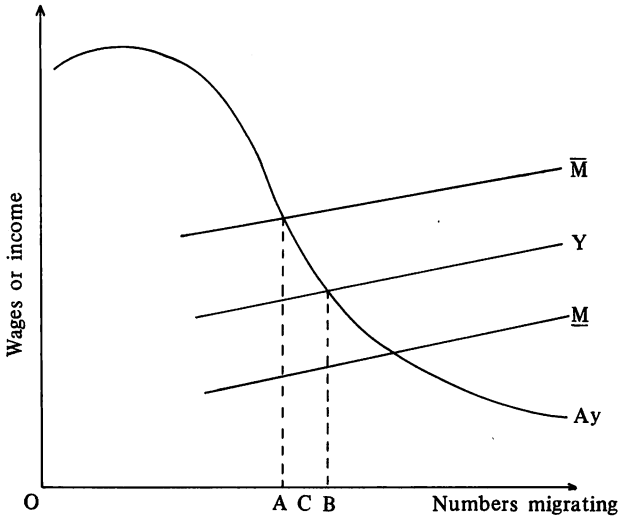


Diagram 5

Leibenstein's X-efficiency theory of migration is summarized in Diagram 5

where, \bar{M} =upper-income bound of potential migrants

y =average income in agricultural sector

A_y =anticipated income in urban sector

\underline{M} =lower-income bound of potential migrants

According to the Torado model, migration will take place until Y is equal to A_y , that is OB on the Diagram. The actual amount of migration, however, would be OA which is determined by the intersection between \bar{M} and A_y . Beyond OA — let us say C , migration does not take place because C is in 'inert areas' (and X-inefficiency) in which individuals do not migrate even if such move is economically more beneficial than the current positions because the utility cost of migration is greater than the utility gain.

Leibenstein's interpretation seems to fit the reality of a relatively advanced economy where regional income differential is not great. But the theory does not hold for a poverty stricken economy where a great deal of rural-urban income differential exists.

In Part II of this study, I shall present an alternative theory of migration and unemployment.

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