Income Expectations, Rural-Urban Migration and Employment in Africa

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IN THE FEW SHORT YEARS since independence, the nations of tropical Africa have experienced an unprecedented increase in the size of their urban populations. From Abidjan to Brazzaville to Nairobi, recorded urban population growth rates of 7 to 10 per cent per annum are a common phenomenon (see table I). Part of this growth is due to the rather rapid rates of over-all population increase in Africa, rates typically around 3 per cent per annum.[2] However, by far the most important contributing factor has been the massive increase in the number of migrants arriving from surrounding rural areas. Numerous factors, both economic and non-economic, underlie the decision of peasant farmers and educated youths to seek the " better life " in the rapidly growing urban centres. In this article I shall examine the relationship between migration, expected income differentials, and urban employment in tropical Africa. I shall begin by briefly presenting a theoretical model of rural-urban migration which places primary emphasis on the economic motivations for migration. This analytical framework, where appropriate, will then be used in the main body of the article, which is devoted to an examination and evaluation of alternative short- and long-run policies designed to curtail the massive influx of rural migrants and to alleviate the concomitant growing unemployment problem in urban Africa.

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[2] For a useful review of African demographic data, see R. K. Som: " Some demographic indicators for Africa ", in John C. Caldwell and Chukuka Okonjo (eds.): *The population of tropical Africa* (London, Longmans, Green & Co., 1968), pp. 187-189.

TABLE I. SUB-SAHARAN AFRICA: URBAN POPULATION GROWTH

City	Year	Population ('000)	Year	Population ('000)		Annual growth (%)	
				City proper	Urban agglom-eration	City proper	Urban agglom-eration
Salisbury	1946	69	1966		330		8.1
Dar es Salaam	1948	69	1967	273		7.5	
Brazzaville	1955	76	1961-62		136		8.7
Dakar	1945	132	1961		375		6.7
Accra	1948	136	1963	616	758	7.8	8.1
Nairobi	1948	119	1968		479		7.2
Abidjan	1955	127	1964		282		9.3
Monrovia	1956	41	1962	81		11.9	
Fort Lamy	1955	29	1964		99		13.6
Cotonou	1945	26	1965	111		7.5	
Mombasa	1948	85	1968		234		5.2
Bamako	1945	37	1965		165		7.8
Bulawayo	1946	53	1966		240		7.8
Lusaka	1950	26	1966		152		11.7
Yaoundé	1955	38	1965	101		10.3	
Douala	1954	118	1965		200		4.9
Addis Ababa	1951	400	1967	644		3.0	
Khartoum-Omdurman	1948	210	1967	390		3.3	
Luanda	1950	150	1960		225		4.1
Léopoldville (Kinshasa)	1946	110	1966	508		8.0	
Elisabethville (Lubumbashi)	1950	103	1966	233		5.2	
Kumasi	1955	75	1968	282	340	10.7	12.3
Lourenço-Marques	1950	94	1960		179		6.7

Sources: United Nations: *Demographic yearbook* (New York), various issues; and William A. Hance: *The geography of modern Africa* (New York, Columbia University Press, 1964), p. 54.

Urban unemployment: a major dilemma

Before turning to a theoretical examination of the economics of rural-urban migration, it should be pointed out that rural-urban migration is by no means an undesirable phenomenon. In fact most of the theories of economic development, which are based largely on the historical experience of Western industrialised nations, emphasise the transformation of an economy from a rural agrarian base to one with an industrial, urban-oriented focus. This process is made possible by the gradual but continuous absorption of " redundant " or " surplus " rural labourers into the growing industrial economy. Under ideal circumstances, the rate of growth of modern sector industries then provides a sufficient number

TABLE II. NON-AGRICULTURAL EMPLOYMENT INDICES IN SELECTED AFRICAN COUNTRIES, 1955-64
(1958 = 100)

Year	Cameroon	Ghana[1]	Kenya	Malawi	Nigeria
1955	102	82	107	88	n.a.
1956	104	91	105	95	95
1957	100	95	105	98	100
1958	**100**	**100**	**100**	**100**	**100**
1959	95	106	100	99	99
1960	91	111	102	96	106
1961	94	122	98	93	89
1962	72	128	97	87	113
1963	91	132	91	87	94
1964	92	n.a.	101	n.a.	n.a.
Rate of growth (%)	−1.0	6.3	−0.5	−0.7	0.1

Year	Sierra Leone	Southern Rhodesia	Tanzania	Uganda	Zambia
1955	87	86	97	94	92
1956	87	92	104	93	100
1957	92	98	101	99	100
1958	**100**	**100**	**100**	**100**	**100**
1959	98	100	96	99	95
1960	101	101	98	99	93
1961	108	98	104	98	90
1962	112	95	101	93	88
1963	119	91	91	89	86
1964	125	90	95	89	91
Rate of growth (%)	0.2	3.0	−0.4	−0.1	−0.9

[1] Note that the relatively high rate of Ghanaian employment growth in the late 1950s and early 1960s was due primarily to the rapid increase in public employment as a result of Nkrumah's " make-work " policy. In the years since 1964, employment growth in Ghana has been negligible since the " make-work " policy could not be sustained for long without undue fiscal strain.

Source: Charles R. Frank, Jr.: *Urban unemployment and economic growth in Africa*, Economic Growth Center Paper No. 120 (New Haven (Connecticut), 1968), p. 254.

of newly created employment opportunities to bring about a more productive and efficient allocation of human resources in the economy as a whole. Unfortunately, real world conditions do not always conform to the hypothetical framework of the economist's development scenario.

In tropical Africa the magnitude of rural-urban migration has greatly exceeded the capacity of the modern industrial sector to absorb the persons concerned, so that it can only employ productively a small proportion of them. Part of the problem relates to the nature of the African industrialisation process itself, a process which has typically failed

TABLE III. URBAN UNEMPLOYMENT RATES IN AFRICA
(%)

Country (urban centres)	Unemployment rate	Country (urban centres)	Unemployment rate
Algeria (1966)	26.6	Kenya (1969)	
Cameroon (1966)		Eight urban areas	17.4
Douala	13.0	Morocco (1960)	20.5
Yaoundé	17.0	Nigeria (1963)	
Congo (1958)		Lagos	15.5
Léopoldville (Kinshasa)	15.0	Ife	19.7
Ghana (1960)		Onitsha	26.3
Large towns	11.6	Kaduna	30.8
Ivory Coast (1963)		Abeokuta	34.6
Abidjan	20.0	Tanzania (1965)	12.6

Sources: *Algeria, Ghana, Morocco* and *Tanzania*—D. Turnham: *The employment problem in less developed countries : a review of evidence* (Paris, OECD Development Centre, 1970), pp. 193-195. *Cameroon* and *Ivory Coast*—Remi Clignet: " Preliminary notes of a study of unemployment in modern African urban centers ", in *Manpower and unemployment research in Africa*, Vol. 2, Apr. 1969. *Nigeria*—Peter C. W. Gutkind: " The energy of despair: social organisation of the unemployed in two African cities: Lagos and Nairobi ", in *Civilisations* (Brussels), Vol. XVII, 1967, No. 3, pp. 186-211, and No. 4, pp. 380-402. *Congo*—P. Raymachers: *Etude par sondage de la main-d'œuvre à Léopoldville* (Ministère du Plan et de la coopération économique, 1958). *Kenya*—H. Rempel and M. P. Todaro: " Rural-urban labour migration in Kenya: some preliminary findings of a large-scale survey ", in S. Ominde (ed.): *Population growth and economic development* (to be published).

to produce a growth of job opportunities at anything near the rate of output growth. If one uses the standard criterion of output growth as the measuring rod for the success of the industrial development effort, many African economies with output growth rates of 5 to 8 per cent per annum have not done that poorly under the circumstances. However, as table II reveals, the growth rate of non-agricultural employment has typically been negligible and, in many cases, negative.

It is in this context of slowly growing urban employment opportunities accompanied by a disproportionately high rate of rural-urban migration that the chronic urban unemployment and underemployment problem has emerged in tropical Africa. Although there are few hard data on the magnitude of African urban unemployment, owing both to conceptual difficulties in defining unemployment and, more importantly, to the fact that very few studies have been directed to the problem, the limited evidence available provides ample empirical confirmation of what any informed observer already knows—namely that urban unemployment is an extremely serious problem (see table III for a summary of available data on urban unemployment rates in African cities). However, in spite of these rising levels of overt unemployment and even higher levels of underemployment, the rate of rural-urban migration shows no sign of

deceleration. To the extent that many newly arrived migrants are likely to join the growing pools of unemployed and highly underemployed workers, and to the extent that an increasingly large proportion of these migrants represent the more educated segments of society whose productive potential is largely being dissipated, the process of continued rural-urban migration at present levels can no longer be said to represent a desirable economic phenomenon. Until something positive is done to relieve this problem, the African development effort will be only partially successful.

A theoretical framework for analysing the economics of rural-urban migration in Africa

In this section I would like to set forth briefly a theoretical framework which yields some important insights into the causes and mechanisms of rural-urban migration in tropical Africa. No attempt will be made to describe this model in any great detail since that has been done elsewhere.[1] I believe that the model can usefully serve two purposes: first, to demonstrate why the continued existence of rural-urban migration in the face of rising levels of urban unemployment often represents a rational economic decision from the point of view of the private individual; and second, to demonstrate how such a theoretical framework can be used in an analysis and evaluation of alternative public policies to alleviate the growing urban unemployment problem.

The individual decision to migrate: some behavioural assumptions

The basic behavioural assumption of the model is that each potential migrant decides whether or not to move to the city on the basis of an implicit, " expected " income maximisation objective. There are two principal economic factors involved in this decision to migrate. The first relates to the existing urban-rural real wage differential that prevails for different skill and educational categories of workers. The existence of large disparities between wages paid to urban workers and those paid to comparably skilled rural labourers has long been recognised as a crucial factor in the decision to migrate.[2] The increasing divergence between

[1] A more detailed description and development of the over-all features of the model can be found in Michael P. Todaro: " The urban employment problem in less developed countries: an analysis of demand and supply ", in *Yale Economic Essays*, Vol. VIII, Fall 1968, pp. 331-402; idem: " A model of labor migration and urban unemployment in less developed countries ", in *American Economic Review* (Menasha (Wisconsin)), Vol. LIX, No. 1, Mar. 1969, pp. 138-148; and John R. Harris and Michael P. Todaro: " Migration, unemployment and development: a two-sector analysis ", ibid., Vol. LX, No. 1, Mar. 1970, pp. 126-142.

[2] Some of the more recent studies identifying economic forces as principal factors affecting the decision to migrate include Ralph E. Beals, Mildred B. Levy and Leon N. Moses: " Rationality and migration in Ghana ", in *Review of Economics and Statistics* (Cambridge (Massachusetts)), Vol. XLIX, No. 4, Nov. 1967, pp. 480-486; John C. Caldwell: *African*

(Footnote continued overleaf)

urban and rural incomes has arisen both as a result of the relative stagnation of agricultural earnings (partly as a direct outgrowth of post-war bias toward industrialisation at the expense of agricultural expansion) and the concomitant phenomenon of rapidly rising urban wage rates for unskilled workers. For example, in Nigeria Arthur Lewis noted that " urban wages " are typically at levels twice as high as average farm incomes. Between 1950 and 1963 prices received by farmers through marketing boards in southern Nigeria fell by 25 per cent while at the same time the minimum wage scales of the Federal Government increased by 200 per cent.[1]

In Kenya average earnings of African employees in the non-agricultural sector rose from £97 in 1960 to £180 in 1966, a growth rate of nearly 11 per cent per annum. During the same period the small farm sector of Kenya experienced a growth of estimated family income of only 5 per cent per annum, rising from £57 in 1960 to £77 in 1966. Consequently, urban wages rose more than twice as fast as agricultural incomes in Kenya so that in 1966 average wages in the urban sector were approximately two-and-a-half times as high as average farm family incomes.[2] Moreover, the urban-rural income differential in Kenya in 1968 varied considerably by level of educational attainment. For example, whereas farm income was approximately K£85 in 1968, individuals with zero to four years of primary education in urban areas earned on the average K£102, those with five to eight years of primary education earned K£156, while migrants who had completed from one to six years of secondary education earned on the average K£290 per annum in 1968.[3]

A final example of the growing disparity between urban and rural incomes can be gleaned from Uganda data. During the period 1954 to

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rural-urban migration. The movement to Ghana's towns (New York, Columbia University Press, 1969); Lowell E. Gallaway: " Industry variations in geographic labor mobility patterns ", in *Journal of Human Resources* (Madison (Wisconsin)), Vol. II, No. 4, Fall 1967, pp. 461-474; J. Gugler: " On the theory of rural-urban migration: the case of sub-Saharan Africa ", in J. A. Jackson (ed.): *Sociological studies Two : migration* (Cambridge, University Press, 1969), pp. 134-155; John R. Harris and Michael P. Todaro: " Urban unemployment in East Africa: an economic analysis of policy alternatives ", in *East African Economic Review* (Nairobi), Vol. 4 (New Series), No. 2, Dec. 1968, pp. 17-36; and H. Rempel: " Labor migration into urban centers and urban unemployment in Kenya " (unpublished PhD dissertation, University of Wisconsin, 1970). See also C. R. Frank, Jr.: " The problem of urban unemployment in Africa ", Research Program in Economic Development, Discussion Paper No. 16, Princeton University, Nov. 1970, for a useful review of the literature on urban unemployment in Africa.

[1] W. Arthur Lewis: *Reflections on Nigeria's economic growth* (Paris, OECD Development Centre, 1967), p. 42.

[2] Dharam P. Ghai: " Incomes policy in Kenya: need, criteria and machinery ", in *East African Economic Review*, op. cit., Vol. 4 (New Series), June 1968, p. 20.

[3] For an analysis of the relationship between education and migration in Africa, see Michael P. Todaro: " Education and rural-urban migration: theoretical constructs and empirical evidence from Kenya ", paper prepared for the Conference on Urban Unemployment in Africa, Institute for Development Studies, University of Sussex, Sep. 1971, especially pp. 16-30.

1964 agricultural incomes remained essentially unchanged while minimum wages in government employment in Kampala rose by almost 200 per cent from £31 to £90 per annum.[1] It should be noted that in Uganda as in most other African nations the minimum wage often acts as the effective rate which determines the level at which more than 50 per cent of urban unskilled workers are paid. It is also the key weight in the overall wage structure since when the minimum wage changes, the entire wage structure tends to move with it.[2]

The second crucial element, which for the most part has not been formally included in other models of rural-urban migration, relates to the degree of probability that a migrant will be successful in securing an urban job. Without introducing the probability variable it would be extremely difficult to explain the continued and often accelerated rate of migration in the face of sizeable and growing pools of urban unemployed. Arguments about the irrationality of rural peasants who unwittingly migrate to urban areas permeated by widespread unemployment are as ill-conceived and culture-bound as earlier assertions that peasant subsistence farmers were unresponsive to price incentives. The key, in my opinion, to an understanding of the seemingly paradoxical phenomenon of continued migration to centres of high unemployment lies in viewing the migration process from an " expected " or permanent income approach where expected income relates not only to the actual wage paid to an urban worker, but also to the probability that he will be successful in securing wage employment in any given period of time. It is the combination and interaction of these two variables—the urban-rural real income differential and the probability of securing an urban job—which I believe determine the rate and magnitude of rural-urban migration in tropical Africa.

Consider the following illustration. Suppose the average unskilled or semi-skilled rural worker has a choice between being a farm labourer (or working his own land) for an annual average real income of, say, 50 units, or migrating to the city where a worker with his skill or educational background can obtain wage employment yielding an annual real income of 100 units. The more commonly used economic models of migration, which place exclusive emphasis on the income differential factor as the determinant of the decision to migrate, would indicate a clear choice in this situation. The worker should seek the higher-paying urban job. It is important to recognise, however, that these migration

[1] J. B. Knight: " The determination of wages and salaries in Uganda ", in *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 29, No. 3, Aug. 1967, pp. 233-264.

[2] For a useful discussion of the relationship between wages and employment in Africa, see Elliot J. Berg: " Wage policy and employment in less developed countries ", paper prepared for the Overseas Study Committee Conference " Prospects for Employment Opportunities in the Nineteen-Seventies ", University of Cambridge, 1970.

models were developed largely in the context of advanced industrial economies and, as such, implicitly assume the existence of full employment or near-full employment. In a full employment environment the decision to migrate can in fact be predicated solely on securing the highest-paying job wherever it becomes available. Simple economic theory would then indicate that such migration should lead to a reduction in wage differentials through the interaction of the forces of supply and demand, both in areas of out-migration and in points of in-migration.

Unfortunately, such an analysis is not very realistic in the context of the institutional and economic framework of most of the nations of tropical Africa. First of all, these countries are beset by a chronic and serious unemployment problem with the result that a typical migrant cannot expect to secure a high-paying urban job immediately. In fact, it is much more likely that upon entering the urban labour market the migrant will either become totally unemployed or will seek casual and part-time employment in the urban traditional sector. Consequently, in his decision to migrate the individual in effect must balance the probabilities and risks of being unemployed or underemployed for a considerable period of time against the positive urban-rural real income differential. The fact that a typical migrant can expect to earn twice the annual real income in an urban area that he can in a rural environment may be of little consequence if his actual probability of securing the higher-paying job within, say, a one-year period is one chance in five. In such a situation we could say that his actual probability of being successful in securing the higher-paying urban job is 20 per cent, so that his " expected " urban income for the one-year period is in fact 20 units and not the 100 units that the fully employed urban worker receives. Thus, with a one-period time horizon and a probability of success of 20 per cent it would be irrational for this migrant to seek an urban job even though the differential between urban and rural earnings capacity is 100 per cent. On the other hand, if the probability of success were, say, 60 per cent, so that the expected urban income is 60 units, then it would be entirely rational for our migrant with his one-period time horizon to try his luck in the urban area even though urban unemployment may be extremely high.

If we now approach the situation more realistically by assuming a considerably longer time horizon, especially in view of the fact that the vast majority of migrants are between the ages of 15 and 23 years, then the decision to migrate should be represented on the basis of a longer-term, more permanent income calculation. If the migrant anticipates a relatively low probability of finding regular wage employment in the initial period but expects this probability to increase over time as he is able to broaden his urban contacts, then it would still be rational for him to migrate even though expected urban income during the initial period or periods might be lower than expected rural income. As long as the present value of the net stream of expected urban income over the

migrant's planning horizon exceeds that of the expected rural income, the decision to migrate is justified.

The mathematical details of our model of rural-urban migration are set forth in the Appendix to this article. For our present purposes, suffice it to say that the model attempts to demonstrate the conditions under which the urban-rural " expected " income differential can act to exacerbate the urban *unemployment* situation even though urban *employment* might expand as a direct result of government policy. It all depends on the relationship between migration flows and the expected income differential as expressed in an " elasticity of migration response " term developed in the Appendix.

Since the elasticity of response will itself be directly related to the probability of finding a job and the size of the urban-rural real income differential, the model illustrates the paradox of a completely urban solution to the urban unemployment problem. Policies which operate solely on urban labour demand are not likely to be of much assistance in reducing urban unemployment since, in accordance with our expected income hypothesis, the growth of urban employment *ceteris paribus* also increases the rate of rural-urban migration. If the increase in the growth of the urban labour force caused by migration exceeds the increase in the growth of employment, the level of unemployment in absolute numbers will increase and the unemployment rate itself might also increase. This result will be accentuated if, for any increase in job creation, the urban real wage is permitted to expand at a greater rate than rural real income. A reduction or at least a slow growth in urban wages, therefore, has a dual beneficial effect in that it tends to reduce the rate of rural-urban migration and increase the demand for labour.

A second implication of the above model is that traditional methods of estimating the " shadow " price of rural labour to the urban sector will tend to have a downward bias if the migration response parameter is not taken into account. Typically, this shadow price has been expressed in terms of the marginal product of the rural worker who migrates to the city to secure the additional urban job. However, if for every additional urban job that is created more than one rural worker is induced to migrate, then the opportunity cost will reflect the combined loss of agricultural production of all those induced to migrate, not just the one who is fortunate enough to secure the urban position. It also follows that whenever there are sizeable pools of urban unemployed, traditional estimates of the shadow price of urban labour will reflect an upward bias.

Policies to alleviate urban unemployment and regulate the flow of rural-urban migration

Let us turn now to an examination of alternative policies which might be adopted to relieve the serious urban unemployment problem

in tropical African nations. Throughout this examination I shall attempt wherever possible to utilise the analytical framework mentioned in the previous section and developed in the Appendix. Since the urban unemployment problem has short, intermediate and long-range dimensions and since there is a wide range of policies available, some of which can have a more immediate impact than others, I shall attempt to distinguish policies that are likely to have quicker results from those whose effects may be more of an intermediate or long-term nature.

Short-run policies

There are a whole series of possible policy options that can have a relatively short-run impact on both employment and unemployment. Of these, the most significant include (1) the elimination of present factor-price distortions, (2) the establishment of a "dual" wage structure through the use of wage subsidies in some combination with a policy of wage restraint, (3) the immediate creation of new types of employment opportunities through various voluntary agreements, and (4) the restriction of excess migration through the use of moral exhortation to return to the land, the adoption of forced controls on the movement of people, or the establishment of urban labour exchanges to regulate and control the process of job placement. Let us briefly examine each of these policies in turn.

1. ELIMINATING FACTOR-PRICE DISTORTIONS

With the benefit of hindsight, it is now becoming painfully apparent how the conventional wisdom of economic development theory which placed top priority on the rapid accumulation of capital as the key to successful economic progress in the 1950s and early 1960s has led to the serious employment predicament of the 1970s. Typically, a spectrum of policy devices ranging from overvalued exchange rates to accelerated capital depreciation allowances, tax rebates, licensing agreements, and negative effective rates of protection for imported capital goods was instituted, which effectively pushed the price of capital well below its real opportunity cost. On the other hand, in their natural and understandable desire to raise the standard of living of their working populations, African governments acquiesced to pressure both from trade unions and from civil servants in setting urban wage rates at levels considerably in excess of rural average incomes and the over-all opportunity cost of urban labour.

This combination of underpriced capital and overpriced labour has no doubt been a factor in retarding the expansion of urban employment opportunities by encouraging capital-labour substitution in the production process. Moreover, this implicit bias towards relatively capital-intensive methods of production has been aided and abetted by the policies of national aid agencies which continue to insist on tying considerable

proportions of their aid to the importation of their own nation's capital equipment. The impact of this distorted factor-price structure is felt not only in urban areas where sophisticated modern equipment is being installed in almost all newly established industries, but also in rural agricultural areas where premature tractor mechanisation is being encouraged by similar policies relating to the importation of farm machinery.

The widespread existence of undervalued capital prices and wages in excess of labour's opportunity cost has also contributed to the influx of rural migrants in spite of the relatively slow growth of urban job openings. By mechanising their production efforts, employers in the modern sector are able to offer relatively high wages for their limited number of employees and unions are able to justify these high wages on the basis of rising levels of labour productivity even though this higher productivity is due not so much to the skills of the workers as to the equipment they are using.

It follows that one of the most immediate and pressing short-run policies that needs to be given serious consideration by governments in tropical Africa is one which attempts to " clear the decks " by eliminating factor-price distortions that inhibit increased labour absorption. In fact, given the pressing need for more employment creation from a political as well as from an economic standpoint, one might even argue that governments should consider the advisability of even distorting factor prices in the opposite direction. This could be achieved by discouraging the further importation of highly capital-intensive equipment by forcing the price of capital above its real opportunity cost, and reducing the effective labour price to producers through, for example, some system of wage subsidies. In any case, governments should at least think seriously about eliminating the current factor-price distortions.

2. WAGE SUBSIDIES AND WAGE RESTRAINT

One of the principal mechanisms for the partial elimination of factor-price distortions and the encouragement of more labour-intensive practices is the establishment of some form of " dual " wage structure that incorporates wage subsidies as part of an over-all employment-generating strategy. The establishment of a dual price structure has long been advocated and practised in other areas of economic activity like trade and agriculture through the use of multiple exchange rates and farm price supports. On *a priori* grounds there is no reason to assume that such a dual price structure would be less suitable for employment generation. Subsidies which lower the effective level of compensation that employers must pay their employees should have a stimulating employment effect so long as the wage elasticity of demand for labour is reasonably positive. A number of recent studies have confirmed the

existence of such a positive elasticity.[1] For example, in a study of wages, employment and productivity in Kenya it was estimated that in the manufacturing sector of Kenyan industry the wage elasticity of demand for labour was approximately 0.76.[2] This would indicate that a 10 per cent reduction in wage costs for employers will stimulate a 7½ per cent increase in employment opportunities. Since a good proportion of the subsidy payments will be returned to the government in the form of higher taxation, both corporate and personal, it is reasonable to expect that a system of wage subsidies can operate somewhat in the manner of the traditional wages fund.

Unfortunately, one of the problems associated with any system of wage subsidies, especially when such subsidies are not part of a larger policy package, is that the actual wage paid to the employee will still be in excess of labour's opportunity cost. The result is that the higher wage is now being paid to a larger proportion of the urban workforce, a fact which in turn increases the probability that a typical migrant will be successful in securing a job. Using the model of rural-urban migration, I demonstrated earlier how such a situation could then lead to a worsening of the urban *unemployment* problem through increased migration even though more urban *employment* might be created.

It is essential, therefore, that any wage subsidy programme be accompanied by a general policy of wage restraint. Otherwise, the total effect of the subsidy might be negated by rising levels of over-all wages. From a strictly economic viewpoint, what is probably needed is a general reduction in over-all wages, but the political realities of developing nations usually preclude such a possibility. Nevertheless, as pointed out earlier, a policy of wage restraint can have a dual beneficial effect on the urban labour situation. A restraint on urban wage increases will tend to reduce the rate of rural-urban migration *and* increase the demand for employment. Without wage restraint, efforts to stimulate employment by reducing the capital-labour ratio through the elimination of some of the factor-price distortions referred to above can only have a limited success in reducing urban unemployment.

3. EMPLOYMENT CREATION BY VOLUNTARY AGREEMENT

Another policy of a short-term nature which has attracted considerable interest was the effort on the part of the Government of Kenya in 1964 to stimulate immediate employment creation through the establishment of a Tripartite Agreement between itself, employers, and the trade

[1] See, for example, Lloyd G. Reynolds: " Wages and employment in a labor-surplus economy ", in *American Economic Review*, op. cit., Vol. LV, No. 1, Mar. 1965, pp. 19-39; and John R. Harris and Michael P. Todaro: " Wages, industrial employment and labour productivity: the Kenyan experience ", in *Eastern Africa Economic Review* (Nairobi), June 1969, pp. 29-46.

[2] Harris and Todaro: " Wages, industrial employment...", op. cit., p. 36.

unions. Under this Agreement, the Government and the employers were to increase their total employment by 15 per cent and 10 per cent respectively, while the trade unions, for their part, agreed to hold the line on all wage demands for a twelve-month period. Upon expiry the Agreement was extended for an additional three months. While no detailed study of this most interesting experiment has been undertaken, it is widely believed that the Tripartite Agreement did not have any lasting long-term effect on employment generation. For example, Professor Dharam Ghai of the Institute for Development Studies in Nairobi made the following observations on the 1964 Tripartite Agreement:

> Owing to financial stringency, the Government found itself unable to carry out its pledge. In all, 34,000 jobs were found for persons who were either landless or previously unemployed. But it is doubtful whether these represented a net increase in employment; for while many of the private firms adhered to the letter of the agreement by taking on more employees, they violated its intent by not hiring new employees to make good the loss caused by normal attrition of the labour force. Furthermore, even if the agreement was successful in creating some new jobs, it did not make any particular impact on the level of urban unemployment, for prospects of wage employment stimulated an additional flow of migrants from the rural areas. It is clear that policies of this nature can create additional employment only in the very short-run period.[1]

Once again, our model of rural-urban migration can shed some interesting light on policies such as the Tripartite Agreement which are intended to eliminate or alleviate urban unemployment through a mechanism which attempts essentially to circumvent economic forces. The Tripartite Agreement provides an excellent example of the crucial importance of the probability factor in the decision to migrate. By requiring employers to increase the number of job openings by a certain percentage and blocking any increases in urban wage rates for a fifteen-month period, the Agreement effectively increased the probability that a migrant would successfully secure a job while ensuring that the wage differential would be held constant. Our model tells us that in such a situation there should be an accelerated flow of rural-urban migration resulting from the widening of the " expected " income differential even though the actual differential remains unchanged. This is in fact what actually happened in Kenya immediately following the announcement of the Agreement, when there was a massive influx from the rural areas of job seekers who had learned of the move to increase employment opportunities. The result of the entire process as pointed out by Ghai [2], Harbison [3] and others was that actual levels of urban *unemployment*

[1] Dharam P. Ghai: " Employment performance, prospects and policies in Kenya ", paper prepared for the Overseas Study Committee Conference " Prospects for Employment Opportunities in the Nineteen-Seventies ", University of Cambridge, 1970, p. 11.

[2] Ibid.

[3] Frederick H. Harbison: " The generation of employment in newly developing countries ", in James R. Sheffield (ed.): *Education, employment and rural development* (Nairobi, East African Publishing House, 1967), pp. 173-193.

probably increased whereas the over-all level of *employment* did not change substantially.

It is interesting to note that in June 1970 the Government of Kenya announced another Tripartite Agreement under which both it and private firms were required to increase their employment rolls by 10 per cent. Early reports indicated once again that the net impact of this second attempt at instant employment creation was a further increase in the level of urban unemployment.

The above observations are not meant to belittle the potential importance of voluntary agreements such as those initiated by the Kenyan Government but rather to emphasise the point that when short-run policies are not accompanied by more basic long-run structural changes in the economic system they can have very limited lasting effects.

4. RESTRICTIONS ON MIGRATION

Short-run attempts to ease the urban unemployment problem can also take the form of efforts to restrict the accelerated influx of rural migrants whose chances of securing an urban job are minimal. These policies can range from simple " moral exhortations " to return to the land, as has been intermittently practised by the Kenyan Government, to enforced back-to-the-land movements such as that practised for some time in Tanzania, and the establishment of labour exchanges to control the flow of migration in accordance with job openings, a policy which has been suggested recently by a number of observers.

Exhortations that individuals should return to the land to seek opportunities in agriculture rather than migrating to the cities in a vain search for jobs have been heard repeatedly in speeches by political leaders in East Africa. While these pleas are admirable and economically sound, their ultimate success is highly doubtful. If our model correctly describes the economics of migration it is in the self-interest of individuals to seek urban employment even though the probability of actually finding it is low. Throughout history, policies of moral suasion have met with limited success in persuading individuals to abandon their self-interest. When the social and the private interest do not coincide it is rare that private calculations do not prevail.

A more direct effort to regulate the flow of rural-urban migration, one which forces the urban unemployed to return to their rural areas, has been instituted by the Government of Tanzania, though the policy has not been carried out with exceptional vigour. Individuals in urban areas of Tanzania are required to hold cards stamped to show that they are presently employed. If they cannot produce one they are liable to be returned either to their home area in the countryside or to some other rural location if they are landless. Clearly, if the urban unemployed are

individuals who have productive opportunities available to them in rural areas, as most do in the case of Tanzania, the successful repatriation of the unemployed can result in a net increase in national output and thus be socially productive. But, as in the case of moral suasion, it is extremely difficult to convince individuals acting in their own private interests that both the net national interest and the social benefit would be best served by their returning to the rural areas. Along these lines, it is interesting to note that Tanzania is already experiencing difficulties in keeping the repatriated urban unemployed on farm settlements. This is not too surprising given the substantial expected real earnings differential, even though Tanzania has attempted to hold the line on urban wage increases. Moreover, there has been no real attempt to compensate the repatriated workers. In summary, while Tanzania's policy of enforced repatriation represents a promising approach to the problem of urban unemployment, its probable success is at best very limited.

Gugler has recently suggested an interesting alternative short-run approach to restrict migration in countries that have rural opportunities for their urban unemployed.[1] Recognising the importance of the probability variable in the decision to migrate and the fact that most migrants are prepared to risk being unemployed for a considerable period of time, Gugler suggests that, instead of letting individual migrants gamble in the hope of being selected, the government should play the lottery for them through the institution of urban labour exchanges. His idea is that if all employment openings were to be channelled through government labour exchanges, these exchanges would be able to give definitive answers to new migrants on whether or not they will be successful in obtaining a job. Those unsuccessful, having been told that there is no employment for them at that time and that they will not be reconsidered at a later time could thus be persuaded, in Gugler's opinion, to return to their rural homes after a short stay in town. To be successful such a programme would need the full co-operation of employers and a high standard of record keeping at the labour exchanges so that it would be possible to recognise and refuse the man who applied for a second time even though he might change his name.

While I agree that this is an intriguing idea and probably a better approach than simple moral suasion, I am extremely doubtful of its feasibility as an actual policy. In addition to the severe resource and book-keeping problems that would be involved, especially since one would need to have much more than the mere names of rejected migrants, there is the additional and obvious problem of bureaucratic corruption, tribal preferences, and the relinquishment of the individual employer's right to decide who he will hire and who he will not hire. Consequently, of the three short-run approaches to migration restriction, the Tanzanian

[1] Gugler, op. cit.

plan of forced repatriation is probably the most feasible though it too can give rise to serious administrative and political difficulties.

Intermediate-term policies

In addition to the four policy options outlined above, all of which are intended to have more immediate effects on employment generation, there are a number of policies whose impact on job creation can be more lasting and significant although perhaps not as immediately visible as the short-run measures. Three of the most important intermediate term strategies include (1) the establishment of a comprehensive incomes policy, (2) the acceleration of rates of industrial and urban output growth, and (3) the intensification of efforts to stimulate agricultural and rural development.

1. A COMPREHENSIVE INCOMES POLICY

Any serious attempt to tackle the dual problem of massive rural-urban migration and rising unemployment must have as its primary objective the gradual elimination of the substantial and economically unwarranted differential between urban and rural real earnings capacity. In the absence of effective migration control, any policy which attempts to stimulate job creation in the urban areas without at the same time attempting to redress the serious imbalance between urban and rural income levels can only result in ultimate frustration, since any increase in jobs created is likely to be offset by a more rapid increase in new job seekers. Consequently, there is an important need gradually to align urban wage incomes more closely with average incomes in the agricultural sector.

The need for a comprehensive national income and wages policy in efforts to generate more employment opportunities, as well as to remove some of the inequities in the distribution of income, has been a subject of considerable recent discussion. As was pointed out earlier, wages affect the employment problem in two ways. First, rapidly rising urban wage rates tend to reduce the level of employment or to limit its expansion in a growing economy by exerting financial pressure on employers to economise on the use of labour. In the case of Kenya, recent empirical studies have indicated that a decline in annual increases in urban wage rates from, say, 6 per cent to 2 per cent would generate approximately 15,000 additional jobs per year. Second, by increasing the gap which already exists between rural and urban real incomes, rising wages may accentuate the urban unemployment problem by stimulating additional rural-urban migration. It is because of this doubly deleterious effect of rapidly rising wage rates that a programme of wage restraint has to be part of an over-all incomes policy.

Since the vast majority of the population of tropical Africa is agrarian-based, it makes considerable economic sense, as well as being more equitable, to attempt to relate minimum wage rates of unskilled workers in paid employment to the average level of agricultural incomes. This is because the minimum wage rate tends to be the most strategic single rate in most African wage structures.[1] The moral case for equity in income distribution is obvious. The economic rationality of such a wage policy is also clear. By eliminating the artificial incentive for disproportionate migration (which may be privately rational but is also socially costly), an effective policy of urban wage realignment can have an important and positive intermediate-term impact on the national output by improving the distribution of income arising from that national output and generating employment opportunities in both rural and urban areas.

A second aspect of a comprehensive incomes policy directed at the creation of more job opportunities might focus on the use of the tax structure to complement policies of wage restraint in reducing the rural-urban real income differential. Tax concessions can be used to provide incentives to employers to accelerate the marginal rate of labour absorption within their firms as output expands. It is well known that many of the tax structures in contemporary African nations are both regressive in their over-all structure and biased against the agricultural sector in particular. In the absence of a policy of wage restraint or in combination with a policy of gradual wage increases, governments can use their tax powers to reduce the level of effective income differentials. A disproportionately high tax on urban wages, for example, can act as a disincentive to further rural-urban migration in the same way as an actual reduction in money wages. Moreover, if the revenue generated from such taxes, as well as from comparable taxes on urban business profits, were to be redirected towards the rural sector in the form of direct transfer payments or rural development projects, then it could be a powerful mechanism for removing some of the present artificial distortions between urban and rural economic opportunities.

Finally, instead of using the tax structure as an incentive for rapid capital accumulation through depreciation guidelines and tax rebates, governments can contribute to the growth of new employment opportunities by instead providing incentives for additional employment creation through these very same tax powers. In any case, the effective formulation and implementation of a well-planned incomes policy can be a powerful potential weapon in the fight against unemployment in urban Africa. It will be most interesting to follow the progress of the comprehensive incomes policy recently instituted by the Government of Kenya, which includes a determined attempt to restrain urban wage increases.

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[1] See, for example, Ghai: "Incomes policy in Kenya...", op. cit.; and Berg, op. cit.

2. ACCELERATING INDUSTRIAL OUTPUT GROWTH

A panacea often prescribed by economists for almost all the ills of developing nations is rapid industrial modernisation. In fact, the dilemma which many of the African nations face today regarding their employment problem can be said to have arisen partially as a result of a mistaken impression about the primacy of industrial development and import substitution at the expense of agricultural progress and export promotion in the over-all growth process. Many treatises on economic development define the success of various programmes in terms of the ability of the country to reallocate a majority of its labour force from agriculture to industry. Implicit in the assumption of almost all these development models is the belief that industrial output growth will be accompanied by comparable employment growth so that the employment problem will be indirectly solved by the expansion of aggregate output.

Unfortunately, most cross-sectional and time series evidence on the relationship between industrial growth and employment generation in less developed countries provides a uniformly consistent picture of a significant employment lag. It is well known, for example, that in the three East African countries this employment lag has not only been significant but for quite a prolonged period (the late 1950s and early 1960s) there was in fact a negative relationship—i.e. employment in manufacturing actually declined absolutely while output expanded. Numerous reasons can be cited to account for this phenomenon, including the rapid rise in urban wages, the increased mechanisation of production, and the improved efficiency of those already employed as a result of learning-by-doing and on-the-job training programmes. The crucial point to be made in this context, however, is that even though rapid industrial output growth, if successfully achieved, might indeed create more employment opportunities, it will also accentuate the influx of rural migrants unless simultaneous steps are taken to reduce rural-urban real differentials. Consequently, as demonstrated earlier, the net result of increased industrial growth might be not only an increase in urban employment but also a concomitant increase in urban unemployment.

Our intention here is not to denigrate policies designed to expand industrial output as a means of creating more employment opportunities, but rather to counter some of the unfortunate euphoric assertions made about the ability of a nation to solve its growing unemployment problem merely by expanding its aggregate level of total output. Clearly, output expansion is a necessary prerequisite for employment creation. But the type of production technology utilised in achieving it as well as the industrial composition of the aggregate expansion can have considerably more impact on the success of employment generation than the mere achievement of the output growth target. More labour-intensive output

growth is what is needed in conjunction with a package of policies to increase the economic attractions of rural life concurrently with the expansion of urban job opportunities.

3. INTENSIVE AGRICULTURAL AND RURAL DEVELOPMENT

Policies which operate on the demand side of the urban employment picture such as wage subsidies, direct government hiring, elimination of factor-price distortions, and employer tax incentives are probably considerably less effective in the long run in alleviating the *unemployment* problem than are policies designed directly to regulate the supply of labour to urban areas. Policies of rural development are crucial in this regard. Close and informed observers of the African scene such as Lewis, Harbison, Eicher [1], Frank and Hunter all agree on the central importance of rural and agricultural development if the urban unemployment problem is to be effectively solved. The ultimate objective of almost all proposals for rural development as a means of improving the unemployment situation is the restoration of a proper balance between rural and urban incomes and the elimination of ill-conceived government policies which greatly bias development programmes towards the urban industrial sector.

A plethora of proposals designed to increase rural real incomes and amenity levels have been advanced in recent years. Some of the more basic ones have been concerned with the provision of needed amenities such as electricity, piped water, clinics, cinemas, etc., in rural areas so as to reduce the relative attraction of urban centres, particularly for school leavers. Other proposals have included rural settlement schemes, extension services, and training centres. Still others have stressed the importance of locating industry in rural areas so as to spread non-agricultural employment opportunities. Finally, one of the most common suggestions for creating rural employment opportunities is the creation of extensive schemes for labour-intensive rural works. We may note that all the above proposals essentially have one common denominator—they attempt to reduce the urban-rural disparities in *real* income (where real income includes the effects of amenities) and thus the magnet effect of the city.

While the provision of resettlement, extension services, training schemes, rural amenities, and rural-based industries are likely to be effective in increasing rural incomes and therefore to work towards a reduction of the urban-rural differential, the proposals for extensive rural works programmes are particularly interesting. Such works programmes would very likely reduce urban-rural real wage gaps in a number of direct ways. First, individuals could be employed on such projects during non-peak periods in agriculture. They would thus sacrifice less

[1] C. Eicher *et al.*: *Employment generation in African agriculture*, Institute of International Agriculture, Research Report No. 9, Michigan State University, July 1970.

agricultural income in accepting employment of this sort than in migrating to urban areas. Furthermore, the effect of the feeder roads, irrigation schemes, dams, etc., built through such programmes would be to raise agricultural productivity—thus further reducing real income differentials. However, programmes of this type do require inputs of scarce organisational resources if they are to be successful and they also place substantial burdens on the fiscal system or on external aid sources for their finance.

Extensive rural works programmes appear to have been carried out successfully in a number of countries including Tunisia and East Pakistan. In the case of a country such as Kenya, with its considerable experience of successful self-help efforts that have resulted in the creation of hundreds of new schools, health centres and community halls in rural areas, rural works programmes can be built upon the existing foundation of vigour and initiative of voluntary effort at the local level. With appropriate planning on the part of local authorities and the necessary financial commitment on the part of the central government and external aid agencies, it should not be difficult to mount large-scale labour-intensive rural works programmes, thus providing not only immediate employment and income opportunities for rural workers but also the infrastructure required for the longer-run development of rural areas.

Our discussion of rural development has concerned itself exclusively up to this point with non-agricultural aspects of economic progress. However, there also exists considerable scope for output expansion directly within the agricultural sector itself. For example, in their carefully documented and stimulating analysis of employment prospects in African agriculture, Eicher and his colleagues have observed that " Africa's smallholder land tenure system is remarkably labour absorptive provided incentives are available at the farm level ".[1] They argue that as long as African governments avoid premature tractor mechanisation, anti-export agricultural policies, autarkic food policies, and an over-emphasis on government capital-intensive direct production schemes, there is considerable potential for significant increases in labour absorption in the agricultural sector itself. Moreover, they note that it is only a matter of time before the new high-yielding varieties of maize and wheat (and possibly of other food crops), with their dramatic potential for increases in output and income, become widely available and adopted in African nations. With careful planning, these new technologies of food production can be made directly applicable to small as well as to large farmers. Considerable research along these lines is currently being conducted at the International Institute of Tropical Agriculture in Nigeria.

Clearly, the adoption and utilisation of the new high-yielding varieties offer the potential for immediate increases in employment

[1] Eicher *et al.*, op. cit., p. 57.

through the emergence of possibilities for multiple cropping and the increased need for farm labour. The longer-run employment effects of the new technology can be equally significant if effective measures are taken to prevent unwarranted and premature mechanisation of farm production techniques through artificial incentives to import capital equipment.

Long-run policies for employment expansion

In the previous two sections I have explored various short- and intermediate-term policy options available to African governments intent upon expanding over-all employment opportunities and curtailing the disproportionate influx of rural migrants to urban areas. In this final section I shall examine two long-run objectives whose achievement is, in my opinion, a necessary part of any general programme for successful economic development with significant labour participation. The first, and more obvious, of these policies relates to the establishment and maintenance of an effective programme to limit rapid population growth. The second, less obvious but no less important, long-run policy concerns the necessity for less developed African nations ultimately to free themselves from their current technological dependence on the importation of machinery and equipment designed in advanced countries in accordance with the latter's needs. Long-run efforts need to be initiated to plan for the eventual development of their own labour-intensive capital goods industry whose production can be directly responsive to the resource needs and requirements of the African countries themselves.

1. LIMITING POPULATION GROWTH

Although most nations of tropical Africa are not at this time faced with the severe population pressures that are currently being experienced by many countries of south and south-east Asia, the rate of population growth in Africa is currently the highest in the world. Population growth rates in excess of 3 per cent per annum are common south of the Sahara. At such rates of growth, it is only a matter of time before the awful spectre of overpopulation becomes clearly visible.

A successful programme of population control can make a significant contribution over the long run not only to the achievement of the major social and economic objectives of development plans, but more specifically to the ultimate elimination of the problem of unemployment. For example, in Kenya the current rate of population growth is adding 126,000 persons to the labour force every year; the annual increment in the labour force associated with a 2.5 per cent, 1.5 per cent, and a 1 per cent increase would be 95,000, 57,000, and 38,000 additional people respectively. These figures illustrate quite clearly how even small reductions in over-

all rates of population growth can significantly affect prospects for reducing or eliminating urban and rural unemployment. While it is true that for the immediate and intermediate period, i.e. the next fifteen to twenty years, the population size and distribution has been fixed by past levels of births and deaths so that population control will have a limited immediate impact on unemployment, it should not be forgotten that a large number of children can represent a severe drain on a family's financial resources and thus be a deterrent to savings and investment. Recent empirical evidence has shown that savings rates are strongly influenced by dependency ratios which in turn are determined by the rates of over-all population growth.[1] Moreover, a country with a lower rate of population growth has less need to invest its scarce resources in schools, hospitals and other elements of the economic infrastructure, and can divert them to more directly productive projects with lower capital-output ratios and higher rates of per unit labour utilisation. Thus we see that even though a declining rate of population growth will have its major labour force impact only in the long run, it can have some immediate and significant effects on employment creation indirectly through its impact on the aggregate level of savings and the allocation of public and private resources.

2. GENERATING DOMESTIC LABOUR-INTENSIVE TECHNOLOGICAL CAPABILITIES

One of the principal inhibiting factors to the success of any long-run programme of labour absorption both in the urban industrial as well as in the rural agricultural sector is the complete technological dependence of contemporary African nations on machinery and equipment developed in the advanced industrial nations. In essence, the developing nations of Africa have no choice but to use the capital-intensive technology which has been developed in, by and for the richer industrial countries and must be imported from them. Moreover, since almost 98 per cent of all research and development on new technologies originates in advanced industrial societies, the less developed countries will remain technologically dependent for years to come if nothing is done about the problem. With most available technology being relatively capital intensive in design, the scope for utilising relatively labour-intensive equipment is limited for the most part to the importation of the used and discarded technology of a previous historical period.

When choosing among the available alternatives, less developed nations should make every effort to find and select those parts of modern technology which are of direct value to themselves and which do not

[1] Nathaniel H. Leff: "Dependency rates and savings rates", in *American Economic Review* (Menasha (Wisconsin)), Vol. LIX, No. 5, Dec. 1969, pp. 886-896.

inhibit employment creation. Many of the efforts to find and utilise " intermediate " technologies have this aim. The only other alternative is to attempt to adapt imported technology to local needs. As the history of Japanese development and the contemporary records of Korea and Taiwan indicate, there is considerable scope for indigenous capital-stretching through the more intensive utilisation of existing machinery, the handling, transporting and packaging of materials within the plant by human instead of mechanical means, and by the training of skilled personnel to repair and replace damaged machinery parts.

In addition to the actual equipment, there is a range of complementary factors which together give imported technology a capital-intensive rather than a labour-intensive twist. Private foreign investors, as well as aid donors, have tended to emphasise the supply of imported capital equipment of the most sophisticated nature for their own pet projects; and technicians, planners, advisers, contractors and consultants are typically imported from abroad or trained abroad or even when trained at home they still tend to be acquainted with the most modern technologies available and are very unfamiliar with alternative possibilities. Finally, the planners, politicians and even the people themselves in developing countries take a natural pride in big and expensive capital structures which are often looked upon as being synonomous with economic development and modernisation.

Since both the mechanism and the dynamics of technology transfer are such that less developed countries have little or no influence on either the production technique they use today or the technique it would be most desirable to use in the future, the task of effectively absorbing large increments of the labour force into an over-all framework of industrial and agricultural progress is made that much more difficult.

The question then arises as to what are the alternatives. I have recently argued that the only real and viable long-run alternative is for the developing countries themselves, either singly or preferably in co-operation, to begin the task of generating their own technology through the creation of a capital goods industry that will be responsive to the unique needs of labour-surplus societies.[1] The creation of indigenous capital goods industries will require for the most part the training of engineers and scientists with creative as well as technological capabilities. It will be a long-run process and will of necessity require the co-operation and the technical and financial aid of advanced societies. One possible way of overcoming the initial administrative, financial and skill requirements of such an enterprise might be through the creation of a series of Regional Institutes for the Development of Labour-Intensive Technologies along the lines of the very successful programmes sponsored by the

[1] Michael P. Todaro: " Some thoughts on the transfer of technology from developed to less developed nations ", in *Eastern Africa Economic Review*, op. cit., June 1970, pp. 53-64.

Rockefeller and Ford Foundations establishing research institutes for the development of new high-yielding food varieties. If such institutes had links both with the government and private industries so as to identify important potential growth areas with significant capacity for labour absorption, and if the necessary training component were built into the over-all operation, then the direct income and employment benefits could begin to accrue relatively soon. Just as the operations and research within the international agricultural institutes have gradually been taken over by indigenous personnel, so too the ultimate technological capacities within these regional research institutes might be assumed by indigenous scientists and engineers. Clearly, serious thought needs to be given immediately to the feasibility and possibility of the creation of such technological institutes. The alternative of continued technological dependence is, to say the least, very grim.

Conclusions

I have attempted in this article to set forth the economic basis for rural-urban migration in tropical Africa and have tried to explain the reasons for the continued influx of rural migrants in spite of rising levels of urban unemployment. My examination of alternative short-, intermediate- and long-run policies for relieving the urban unemployment problem had as its common focus and theme the gradual elimination of the wide disparities between " expected " urban and rural real incomes.

Clearly, what is needed if any real impact is to be made on the unemployment problem is not a single policy but a " package " of policies including those whose effects are more immediate, as well as those whose impact will be felt in the longer run. If I were asked to identify and put together such a package of policies, my inclination would be to argue for the immediate elimination of factor-price distortions, especially with regard to the price of capital, a comprehensive incomes policy in which urban wage restraint is an important element, a redirection of present development priorities towards concentrated and comprehensive programmes of rural development including efforts to repatriate and resettle unemployed urban migrants, and a major effort on a regional basis focused on the establishment of indigenous capital goods industries capable of designing and developing labour-intensive technologies for both agriculture and industry. Finally, some programme for controlling excessive population growth is necessary even though this is unlikely to be welcomed by all African governments at the present time. Without such a package of policies, the ubiquitous problem of growing urban unemployment in Africa promises to become economically more severe and politically more explosive in the coming years.

APPENDIX

A Mathematical Model of Rural-Urban Migration

Consider the following formulation of the theory of rural-urban migration used in this article. I begin by assuming that individuals base their decision to migrate on considerations of income maximisation and that their calculations are founded on what they perceive to be their expected income streams in urban and rural areas. It is further assumed that the individual who chooses to migrate is attempting to achieve the prevailing average income for his level of education or skill attainment in the urban centre of his choice. Nevertheless, he is assumed to be aware of his limited chances of immediately securing wage employment and the likelihood that he will be unemployed or underemployed for a certain period of time. It follows that the migrant's expected income stream is determined both by the prevailing income in the modern sector and the probability of being employed there, rather than being underemployed in the traditional sector or totally unemployed.

If we let $V(0)$ be the discounted present value of the expected " net " urban-rural income stream over the migrant's time horizon; $Y_{u,\,r}(t)$ the average real incomes of individuals employed in the urban and the rural economy; n the number of time periods in the migrant's planning horizon; and r the discount rate reflecting the migrant's degree of time preference, then the decision to migrate or not will depend on whether

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

is positive or negative, where

$C(0)$ represents the cost of migration, and

$p(t)$ is the probability that a migrant will have secured an urban job at the average income level in period t.

In any one time period, the probability of being employed in the modern sector, $p(t)$, will be directly related to the probability π of having been selected in that or any previous period from a given stock of unemployed or underemployed job seekers. If we assume that for most migrants the selection procedure is random, then the probability of having a job in the modern sector within x periods after migration, $p(x)$, is:

$$p(1) = \pi(1)$$

and

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

so that

$$p(x) = p(x\text{-}1) + [1-p(x-1)]\pi(x)$$

or

$$p(x) = \pi(1) + \sum_{t=2}^{x} \pi(t) \prod_{s=1}^{t-1} \left[1-\pi(s) \right]$$

where

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

It follows from this probability formulation that for any given level of $Y_u(t)$ and $Y_r(t)$, the longer the migrant has been in the city the higher his probability p of having a job and the higher, therefore, is his expected income in that period.

Formulating the probability variable in this way has two advantages: (1) it avoids the " all or nothing " problem of having to assume that the migrant either earns the average income or earns nothing in the periods immediately following migration: consequently, it reflects the fact that many underemployed migrants will be able to generate some income in the urban traditional sector while searching for a regular job; and (2) it modifies somewhat the assumption of random selection since the probability of a migrant having been selected varies directly with the time he has been in the city. This permits adjustments for the fact that longer-term migrants usually have more contacts and better information systems so that their expected incomes should be higher than those of newly arrived migrants with similar skills.

Suppose we now incorporate this behaviouristic theory of migration into a simple aggregate dynamic equilibrium model of urban labour demand and supply in the following manner. We once again define the probability π of obtaining a job in the urban sector in any one time period as being directly related to the rate of new employment creation and inversely related to the ratio of unemployed job seekers to the number of existing job opportunities, that is—

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

where γ is the net rate of urban new job creation, N is the level of urban employment, and S is the total urban labour force.

If w is the urban real wage rate and r represents average rural real income, then the " expected " urban-rural real income differential d is—

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

or, substituting (1) into (2)—

$$(3)\quad d = w \cdot \frac{\gamma N}{S-N} - r$$

The basic assumption of our model once again is that the supply of labour to the urban sector is a function of the urban-rural *expected* real income differential, i.e.—

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

If the rate of urban job creation is a function of the urban wage w and a policy parameter a, e.g. a concentrated governmental effort to increase employment through a comprehensive programme of industrial import substitution or, as in the case of Kenya, the 1964 and 1970 Tripartite Agreements to raise employment levels, both of which operate on labour demand, we have—

$$(5)\quad \gamma = f_a(w; a)$$

where it is assumed that $\frac{\partial \gamma}{\partial a} > 0$. If the growth in the urban labour demand is increased as a result of the governmental policy shift, the increase in the urban labour supply is—

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

Differentiating (3) and substituting into (6), we obtain—

$$(7)\quad \frac{\partial S}{\partial a} = \frac{\partial S}{\partial d}\, w\, \frac{N}{S-N} \cdot \frac{\partial \gamma}{\partial a}$$

The absolute number of urban unemployed will increase if the increase in labour supply exceeds the increase in the number of new jobs created, i.e. if—

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

Combining (7) and (8), we get—

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

or—

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

or, finally, substituting for d—

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

Expression (11) reveals that the absolute level of unemployment will rise if the elasticity of urban labour supply with respect to the expected urban-rural income differential, $\frac{\partial S/S}{\partial d/d}$, (what I have called elsewhere the " migration response function ") exceeds the urban-rural differential as a proportion of the urban wage times the unemployment rate, $\frac{S-N}{S}$. Alternatively, equation (11) shows that the higher the unemployment rate, the higher must be the elasticity to increase the level of unemployment for any expected real income differential. But note that in most developing nations the inequality (11) will be satisfied by a very low elasticity of supply when realistic figures are used. For example, if the urban real wage is 60, average rural real income is 20, the probability of getting a job is ·50 and the unemployment rate is 20 per cent, then the level of unemployment will increase if the elasticity of urban labour supply is greater than ·033, i.e. substituting into (11) we get—

$$\frac{\partial S/S}{\partial d/d} = \frac{\cdot 50 \times 60 - 20}{60} \times \cdot 20 = \cdot 033$$

Clearly, much more needs to be known about the empirical value of this elasticity coefficient in different African nations before one can realistically predict what the impact of a policy to generate more urban *employment* will be on the over-all level of urban *unemployment*.