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6 Internal Migration in Developing Countries: A Survey

Michael P. Todaro

6.1 Migration and Development: Some Critical Issues

As recently as a decade ago, internal migration in general and rural-urban migration in particular were viewed favorably in the economic development literature. Rapid internal migration was thought to be a desirable process by which surplus rural labor was withdrawn from traditional agriculture to provide cheap manpower to fuel a growing modern industrial complex (Lewis 1954; Fei and Ranis 1961). The process was deemed socially beneficial (at least on the basis of historical evidence; Kuznets 1964, 1971), since human resources were being shifted from locations where their marginal social products were often assumed to be zero to places where these marginal products were not only positive but also rapidly growing as a result of capital accumulation and technological progress.

Herrick (1965) reflected the prevailing view about the desirability of internal migration when he asserted that "in the absence of any movement, when rural fertility exceeds urban fertility, the agricultural labor force will grow faster than industrial employment. Movement from the country to the towns, which is necessary if strictly balanced growth of the two parts of the labor force is to occur, becomes even more important if an increase in the industrial sector is among the goals of the developing economy." Only a few years later, however, Jolly (1970)

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seemed to be echoing a changing perception of the migration issue among economists when he noted that "far from being concerned with measures to stem the flow, the major interests of these economists [those who stressed the importance of labor transfer] was with policies that would *release* labour to *increase* the flow. Indeed, one of the reasons given for trying to increase productivity in the agricultural sector was to release *sufficient* labour for urban industrialization. How irrelevant most of this concern looks today!"

Numerous studies have now documented the fact that throughout the developing world rates of rural-urban migration continue to exceed rates of urban job creation and to greatly surpass the capacity of both industry and urban social services to absorb this labor effectively. No longer is rapid migration viewed by economists as an unambiguously beneficial process necessary to solve problems of growing urban labor demand. On the contrary, migration today is being increasingly viewed as the major contributing factor to the ubiquitous phenomenon of urban surplus labor and as a force that continues to exacerbate already serious urban unemployment problems caused by growing economic and structural imbalances between urban and rural areas.

Migration exacerbates these rural-urban structural imbalances in two major direct ways. First, on the supply side, internal migration disproportionately increases the growth rate of urban job-seekers relative to urban population growth, which itself is at historically unprecedented levels, because of the high proportions of well-educated young people who dominate the migrant stream. Their presence tends to swell the growth of urban labor supply while depleting the rural countryside of valuable human capital. Second, on the demand side, most urban job creation is more difficult and costly to accomplish than rural employment creation because of the need for substantial complementary resource inputs for most modern-sector industrial jobs. For example, an ILO (International Labor Office) estimate of investment costs per worker in Egypt in 1969 showed a cost of \$5,070 for an industrial job compared with \$616 for an agricultural job (ILO 1969). Moreover, the pressures of rising urban wages and compulsory employee fringe benefits in combination with the unavailability of "appropriate" (usually more labor-intensive) production technologies means that a rising share of modern-sector output growth is accounted for by increases in labor productivity. Together, this rapid supply increase and lagging demand growth tend to convert a short-run problem of manpower imbalances into a long-run situation of chronic and rising urban surplus labor.

But the influence of migration on the development process is much more pervasive than its obvious accentuation of urban unemployment and underemployment. In fact, the significance of the migration phenomenon in most developing countries is not necessarily in the process

itself or even in its effect on the sectoral allocation of human resources. It is in the context of its implications for economic growth in general and for the "character" of that growth, particularly its distributional manifestations, that migration research has assumed growing importance in recent years.

We must recognize at the outset, therefore, that migration substantially in excess of new job opportunities is both a symptom of and a factor contributing to Third World underdevelopment. Understanding the causes, determinants, and consequences of internal migration is thus central to a better understanding of the nature and character of the development process. It is also essential for formulating appropriate policies to influence this process in socially desirable ways. A simple yet crucial step in underlining the centrality of the migration phenomenon is to recognize that any economic and social policy that affects rural and urban real incomes will directly or indirectly influence the migration process. This process in turn will itself tend to alter the pattern of sectoral and geographic economic activity, income distribution, and population growth. Since all economic policies have direct and indirect effects on the level and growth of either urban or rural incomes or of both, they *all* will have a tendency to influence the nature and magnitude of the migration stream. Although some policies may have a more direct and immediate effect (e.g., wages and income policies, employment promotion programs), there are many others that, though less obvious, may in the long run be no less important. Included among these policies, for example, would be alterations in the system of land tenure, commodity pricing, rural credit allocation, taxation, export promotion, import substitution, commercial and exchange rate policies, the geographic distribution of social services, the nature of public investment programs, attitudes toward private foreign investors, the organization of population and family planning programs, the structure, content, and orientation of the educational system, the structure and functioning of urban labor markets, and the nature of public policies toward international technological transfer and the spatial allocation of new industries. There is thus a clear need to recognize the central importance of internal migration and to integrate the two-way relationship between migration and population distribution on the one hand and economic variables on the other into a more comprehensive analytical framework designed to improve development policy.

In addition, we need to understand better not only why people move and what factors are most important in their decision-making, but also the *consequences* of internal migration for rural and urban economic and social development. If all development policies affect and are affected by migration, which are the most significant and why? What are the policy options and trade-offs among different and sometimes com-

peting objectives (e.g., curtailing internal migration and expanding educational opportunities in rural areas)? In short, unless we are able to begin to *quantify* the relative effect of different economic policies on the nature, character, and magnitude of such migration and to ascertain what factors influence a person's decision to move in different countries and regions, we will be unable to formulate policies to deal effectively with the dual problems of rapid urban population growth and rising urban marginalism.

My broad objectives in this paper are threefold: first, to examine the literature on migration models and the role of internal migration in the process of economic development; second, to identify what has been empirically tested and where, giving special emphasis to a number of recently concluded econometric country studies; and, third, building on this background to identify the major priority questions in migration research that still remain to be answered and to suggest appropriate methods for dealing with these questions.

6.2 Toward an Empirically Testable Economic Theory of Rural-Urban Migration

The evidence of the 1960s and early 1970s, when many developing nations witnessed a substantial migration of their rural populations into urban areas in spite of rising levels of urban unemployment and underemployment, calls into question the validity of the traditional Lewis type of two-sector models of labor transfer and economic development. In a series of articles, I and others have attempted to fill this gap in migration theory by developing a model of rural-urban migration that tries to explain the apparently paradoxical relationship (at least in terms of traditional neoclassical economics) of accelerated rural-urban migration in the context of continuously rising urban unemployment.¹ We therefore begin by examining the basic nature of the Todaro model, then look at later modifications, criticisms, and extensions.

6.2.1 The Todaro Migration Model

Starting from the assumption that migration is based primarily on privately rational economic calculations despite the existence of high urban unemployment, the Todaro model postulates that migration proceeds in response to urban-rural differences in *expected rather than actual earnings*. The fundamental premise is that as decision-makers migrants consider the various labor-market opportunities available to them as, say, between the rural and urban sectors, choosing the one that maximizes their "expected" gains from migration. Expected gains are measured by the *difference in real incomes between rural and urban work opportunities* and the *probability of a new migrant's obtaining an*

urban job. A schematic framework describing the multiplicity of factors affecting the migration decision is portrayed in figure 6.1. While the factors illustrated in figure 6.1 include both economic and noneconomic variables, the economic ones are assumed to predominate.

The "thought process" of the Todaro model can be explained as follows. Suppose the average unskilled or semiskilled rural worker has a choice between being a farm laborer (or working his own land) for an annual average real income of, say, 50 units per year, and migrating to the city where a worker with his skill or educational background can obtain wage employment yielding an annual real income of, say, 100 units. The more traditional economic models of migration that 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 recognize, however, that these migration models were developed largely in the context of advanced industrial economies and, as such, implicitly assumed the existence of full or near-full employment in urban areas. 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, other factors being held constant. Simple economic theory would then indicate that such migration should lead to a reduction in wage differentials through geographic changes in supply and demand, both in areas of out-migration (where incomes rise) and in points of in-migration (where they fall).

Unfortunately, such an analysis is not very realistic in the context of the institutional and economic framework of most Third World nations. First of all, these countries are beset by a chronic and serious problem of urban surplus labor, so that many migrants cannot expect to secure high-paying urban jobs immediately upon arrival. In fact, it is much more likely that upon entering the urban labor market many migrants will either become totally unemployed or will seek casual and part-time employment in the urban traditional sector for some time.²

Consequently, in his decision to migrate the individual must in effect balance the probabilities and risks of being unemployed or underemployed for a considerable period of time against the positive urban-rural real-income differential. That it is possible for our hypothetical migrant to earn twice as much annual real income in an urban area as in his rural environment may be of little consequence if his actual *probability* of securing the higher-paying job within a year is one chance in five. In such a situation the migrant's actual probability of being successful in securing the higher-paying urban job is 20%, so that his "expected" urban income for the one-year period is in fact 20 units, not the 100 units that a migrant in a full-employment urban environment might expect to receive. Thus, with a one-period time horizon and a probab-

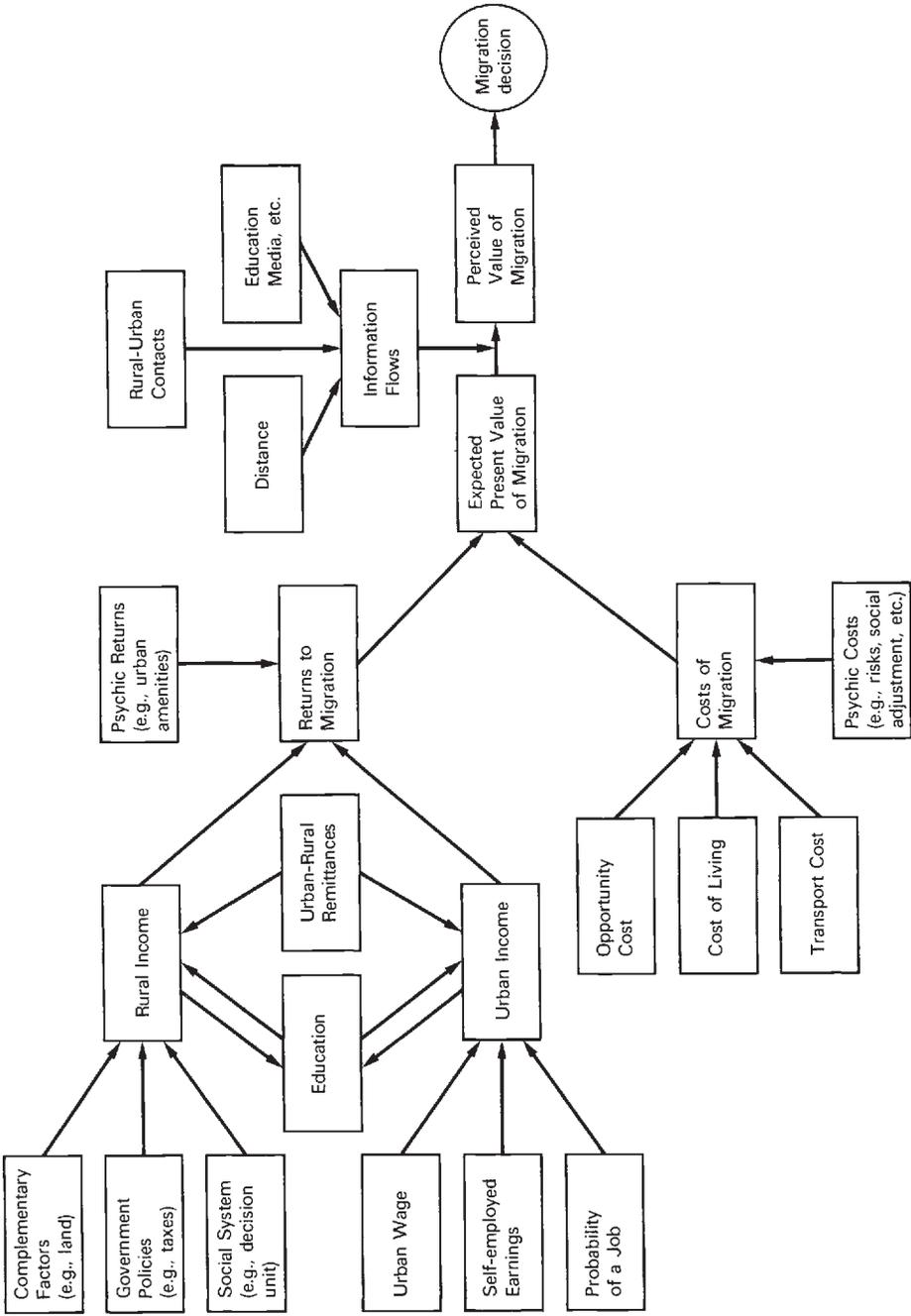


Fig. 6.1 A framework for the analysis of the migration decision.

Fig. 6.1

ity of success of 20% it would be irrational for this migrant to seek an urban job even though the differential between urban and rural earnings capacity is 100%. On the other hand, if the probability of success were, say, 60%, so that the expected urban income is 60 units, it would be entirely rational for such a migrant with his one-period time horizon to try his luck in the urban job "lottery" even though urban unemployment may be extremely high.³

Returning now to the more realistic situation of longer time horizons for potential migrants, especially considering that the vast majority are between the ages of 15 and 24, I argue that the decision to migrate should be represented on the basis of a "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.⁴ 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 economically justified. This, in essence, is the "thought process" that is schematically depicted in figure 6.1.

Rather than wage adjustments bringing about an equilibrium between urban and rural incomes, as would be the case in a competitive model, I argue that rural-urban migration itself must act as the ultimate equilibrating force. With urban wages assumed to be inflexible in a downward direction, rural and urban "expected" incomes can be equalized only by falling urban job probabilities resulting from rising urban unemployment. For example, if average rural wages are 60 units and urban wages are *institutionally* set at a level of 120 units, then in a one-period model a 50% urban unemployment rate would be necessary to vitiate the private profitability of further migration. Since expected incomes are defined in terms of *both* wages *and* employment probabilities, I argue that it is not only possible but likely to have continued migration in spite of the existence of sizable rates of urban unemployment. In the above numerical example, migration would continue even if the urban unemployment rate were 30 or 40%.

6.2.2 A Mathematical Formulation

Consider the following mathematical formulation. Individuals are assumed to base their decision to migrate on considerations of income maximization and 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 this level of education or skill attainment in the

urban center of his choice. Nevertheless, he is assumed to be aware of his limited chances of immediately securing wage employment and of 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 or "enforced" 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 i the discount rate reflecting the migrant's degree of time preference, then the decision to migrate or not will depend on whether

$$V(0) = \sum_{t=0}^n [p(t)Y_u(t) - Y_r(t)] e^{-it} dt - C(0)$$

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 .⁵

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 (with similar demographic and educational characteristics) the selection procedure is random, then the probability of having a job in the modern sector within x periods after migration, $p(x)$, is:

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

$$\text{and } p(2) = \pi(1) + [1 - \pi(1)] \pi(2)$$

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

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

$$\text{where } \prod_{i=1}^n a_i = a_1 \times a_2 \times a_3 \times \dots \times a_{n-1} \times a_n$$

and $\Pi(t)$ 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, 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;⁶ and (2) it modifies somewhat the assumption of random selection, since the probability of a migrant's 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 demographic characteristics and skills (Todaro 1969, p. 142, n.8).

Suppose we now incorporate this behavioristic theory of migration into a simple aggregate dynamic equilibrium model of urban labor demand and supply in the following manner. The rural labor force L_R is assumed to grow at a natural rate, r , less the rate of migration to urban areas, m , or

$$(1) \quad \dot{L}_R = (r - m) L_R,$$

where \dot{L}_R is the time derivative of L_R .

The urban labor force L_u also grows at a rate, r , plus the migration from the rural areas

$$(2) \quad \dot{L}_u = rL_u + mL_R,$$

or, substituting $M = mL_R$, where M represents the actual amount of rural-urban migration, equation 2 can be written as

$$(2') \quad \dot{L}_u = rL_u + M.$$

The growth of urban employment opportunities (the demand for urban labor) is assumed to be constant at a rate, g , so that

$$(3) \quad \dot{E}_u = gE_u,$$

where E_u is the level of urban modern sector employment.

So far the model is quite standard. The major innovation is a migration function in which the rate of rural-urban migration, $m \left(= \frac{M}{L_R} \right)$, is a function primarily of (1) the *probability* that an urban laborer can successfully find a modern-sector job, which in its most elementary form can be written as some simple (positive) monotonic function of the

current urban employment rate $\left(\frac{E_u}{L_u}\right)$ or a negative function of the urban unemployment rate, $\frac{L_u - E_u}{L_u}$, and (2) the *urban-rural income differential*, which can be expressed as a ratio $\frac{Y_u}{Y_r} = W$, where $W > 1$ and is assumed to be fixed as a result of an institutionally determined urban wage and a given rural average product. Migration will also be related to (3) *other* factors, Z , like distance, personal contacts, urban amenities, and so forth, which also exert some influence on the migrant's perception of the relative "costs" and "benefits" of origin and destination opportunities. The basic Todaro migration equation can therefore be written as:

$$(4) \quad m = F\left(\frac{E_u}{L_u}, W, Z\right),$$

$$\text{where } F'\left(\frac{E_u}{L_u}\right) > 0; F'(W) > 0 \text{ and } F'(Z) \geq 0.$$

Holding W and Z constant, the function F can be simplified to read:

$$(5) \quad F\left(\frac{E_u}{L_u}, W, Z\right) = f\left(\frac{E_u}{L_u}\right),$$

$$\text{where } f' \geq 0 \text{ for all values of } \frac{E_u}{L_u} \text{ between zero and one.}$$

Substituting equations 4 and 5 into equation 2 yields the basic differential equation for urban labor force growth in the Todaro model, namely,

$$(6) \quad \frac{\dot{L}_u}{L_u} = r + \frac{L_r}{L_u} f\left(\frac{E_u}{L_u}\right).$$

By then comparing the time path of this equation with the growth rate of urban employment, we can analyze the dynamic process of rural-urban migration and urban unemployment under differing assumptions about population and employment growth rates (see Todaro 1969 and 1971b, appendix).

The main attribute of this mathematical model, however, is its rigorous demonstration that migration in excess of the growth of urban job opportunities not only is privately rational from the point of view of maximizing individual income but will continue to exist so long as the "expected" urban-rural real income differential remains positive. For any given relative real wage differential ($W > 1$), there will exist some urban unemployment rate that will finally equilibrate urban and rural "expected" incomes. But if the relative wage differential continues to grow (as it has in most developing nations), and if real urban wages

are inflexible downward (as they have proved to be throughout the Third World), the rising rates of urban unemployment may never actually be able to exert their ultimate equilibrating influence on migration streams. On the contrary, continued and even accelerated rates of rural-urban migration will continue to exist simultaneously with these ever-higher levels of urban unemployment.

In summary, there are four essential features of the basic Todaro migration model:

1. *migration is stimulated primarily by rational economic considerations* of relative benefits and costs, mostly financial, but also psychological;

2. *the decision to migrate depends on "expected" rather than actual urban-rural real wage differentials* where the "expected" differential is determined by the interaction of two variables—the actual urban-rural wage differential *and* the probability of successfully obtaining employment in the urban modern sector;

3. *the probability of obtaining an urban job is inversely related to the urban unemployment rate*; and

4. *migration rates in excess of urban job opportunity growth rates are not only possible but rational and likely* in the face of continued positive urban-rural *expected* income differentials. High rates of urban unemployment are therefore inevitable outcomes of the serious *imbalances* of economic opportunities between urban and rural areas of most underdeveloped countries.

6.2.3 Modifications of the Basic Todaro Model

There have been a number of important modifications of the basic Todaro migration model since it first appeared as a Ph.D. dissertation in 1967. Many of these modifications were designed to introduce certain elements of reality into the migration process, elements that were assumed away or not taken into explicit account in the original Todaro model. But the basic features of the model remain intact, and they provide the framework for most contemporary econometric migration studies (see section 6.3 below). Among the major modifications of the original model, the following are perhaps among the most significant.

Harris and Todaro (1970)

First, I and my colleague John Harris utilized and extended the basic Todaro framework to construct a two-sector internal trade model of migration and unemployment that permitted explicit attention to the impact of migration on rural incomes, urban and rural output, and total social welfare (Harris and Todaro 1970). The two sectors are the permanent urban and the rural; for analytical purposes they are distinguished from the viewpoint of production and incomes. Thus it is

assumed that the rural sector specializes in the production of agricultural goods, part of which are traded to the urban sector in return for the manufactured goods in which that sector specializes. It is assumed further that the rural sector has a choice of using all available labor to produce agricultural goods, some of which are traded for urban manufactured goods, or using only part of its labor to produce food while "exporting" the remaining labor to the urban sector (through migration) in return for wages paid in the form of manufactured goods. Thus it is assumed that the typical migrant retains his ties to the rural sector. The income he earns is assumed for analytical purposes to accrue to the rural sector. Such an assumption is clearly more valid for most African countries than it is for Asia or Latin America, where migrant ties to the rural sector are less pronounced.

Although these assumptions about intersectoral linkages enable Harris and Todaro to assess the welfare and distributional consequences of migration, they are not necessary for demonstrating the private rationality of continued migration in the face of rising urban unemployment. The crucial assumption for this proposition is once again my hypothesis that rural-urban migration will continue so long as the "expected" urban real income (the wage times the probability of finding a job) exceeds real agricultural income at the margin—that is, potential rural migrants behave as maximizers of expected utility.

The complete Harris-Todaro model, then, represents a simple extension of traditional two-sector neoclassical trade models. Thus there are variable proportions agricultural and manufacturing production technologies for the rural and urban sectors, neoclassical behavioral rules for the determination of levels of factor use and output in each sector, and a traditional trade-theory mechanism for determining the terms of trade between agricultural and manufactured goods. But it is the migration equation that represents the unique, most innovative feature of the overall model.

Harris and Todaro then utilize their internal trade with migration model to draw out a number of policy implications for developing countries. First, they evaluate the welfare effects (in terms of lost or gained output in each sector) of alternative urban employment policies—for example, uniform or sector-specific wage subsidies, urban demand expansion, and migration restriction (see Bhagwati and Srinivasan 1974, below, for a critique of some of this analysis). Second, and more important, they draw attention to the critical importance of urban wage determination, commodity pricing policies, and rural development programs on relative output levels, the terms of trade, and intersectoral labor allocation between sectors as a result of induced migration. Perhaps most important, the Harris-Todaro model shows that accelerated urban employment creation may actually increase levels of unemployment (see

Todaro 1976*b* and below for a new theoretical specification and empirical formulation of this concept of induced migration). Finally, they demonstrate the conditions under which coercive restraints on migration can actually *reduce* the level of rural welfare.

The mathematics of the Harris-Todaro model can be written as follows. Letting W_R and W_u respectively represent nominal agricultural and urban wage rates, E_u the number of urban jobs, and L_u the urban labor force, expected urban income, $E(W_u)$, can be written as:

$$(7) \quad E(W_u) = W_u \frac{E_u}{L_u}.$$

Expected rural income, $E(W_R)$, is simply W_R . The amount of rural-urban migration, $M = L_u$, is once again a function of the urban-rural expected wage differential, that is,

$$(8) \quad M = \dot{L}_u = f(E(W_u) - E(W_R)).$$

The rural-urban equilibrium expected wage condition is then

$$(9) \quad E(W_u) = E(W_R),$$

which becomes

$$(10) \quad W_u \times \frac{E_u}{L_u} = W_R,$$

so that the Harris-Todaro model predicts as a first approximation an "equilibrium" urban *unemployment* rate given by:

$$(11) \quad 1 - \frac{E_u}{L_u} = 1 - \frac{W_R}{W_u}.$$

This prediction should not be taken literally; it is intended only to illustrate an inverse relationship between equilibrium unemployment rates and urban-rural expected wage differentials.

While the combined Todaro/Harris-Todaro theoretical model does capture many of the most important labor market interactions between rural and urban sectors from the viewpoint of internal migration analysis, from an empirical or econometric estimation viewpoint the basic model clearly requires further modification and extension. The following are examples of such modifications and extensions.⁷

Johnson (1971)

Johnson (1971) was one of the first to modify theoretically the basic Todaro/Harris-Todaro model by explicitly introducing variables for the rate of labor turnover and the possibility of the urban employed sharing their income with the unemployed through some form of extended family network. Thus Johnson defines the actual income in urban areas as

$(1 - \alpha) W_u + \alpha W_u n$ for the employed and $\alpha W_u n$ for the unemployed, where W_u is the urban wage rate, n is the urban employment rate, and $\alpha (< 1)$ is the proportion of the total wage bill that is shared with the unemployed (Johnson 1971, p. 22). Therefore, if p is the probability that an individual will be employed at a point in time, urban expected income at that time can be represented as:

$$(12) \quad E(Y_u) = (1 - \alpha) W_u p + \alpha W_u n.$$

Johnson also introduces into Todaro's basic job probability formulation a variable to reflect the rate of labor turnover in the urban modern sector. Rather than new job creation being simple $g \times E_u$ (which assumes no labor turnover), the rate of new urban "hires" can be represented by

$$(13) \quad \dot{E}_u = g \times E_u + \beta E_u,$$

where β is the rate of job turnover.

Although β is probably much lower in developing nations than in developed countries owing to the scarcity of urban-sector job opportunities and the fact that most people who quit do so only with the knowledge that another job awaits them, Johnson's introduction of a labor turnover variable does bring the probability formula of the simple Todaro model a bit closer to reality.

Bhagwati and Srinivasan (1974)

Bhagwati and Srinivasan (1974) provide an extensive yet, on the whole, positive critique of the Harris-Todaro model, identifying some of its major policy conclusions, especially those relating to the migration and employment effect of various wage and production subsidy programs in both rural and urban areas. In particular, they point out that the Harris-Todaro conclusion that a (second-best) combination of an urban wage subsidy with physical migration restriction would be necessary to achieve economywide production efficiency is not correct since a best solution can be realized by a variety of different tax or subsidy schemes, without the necessity of physical restrictions on internal migration.

Cordon and Findlay (1975)

Cordon and Findlay (1975) further extend the Harris-Todaro model by introducing intersectoral capital mobility between the rural and urban sectors in response to differentials in the return on capital. They also examine the comparative static effects of economic growth in both the original Harris-Todaro model and the modified model with perfect capital mobility and with commodity prices determined externally in an open economy framework. They then explore the policy implications of the

modified model and reach a number of conclusions that both support and modify those derived by Harris and Todaro.

Fields (1975)

One of the most extensive and useful modifications of the basic Harris-Todaro framework is that provided by Fields (1975). Fields uses the Harris-Todaro framework of quantity rather than wage adjustments as the principal equilibrating force in urban labor markets to consider four additional factors in the determination of equilibrium levels of urban unemployment in developing countries: (1) a more generalized description of the urban job search process in which a rural resident may have some positive probability of finding an urban job without first migrating to the city; (2) the existence of underemployment in the urban traditional or "informal" sector in which workers are not barred from searching for a modern sector job although their probability of success is lower than that of an unemployed worker who engages in full-time job search; (3) the likelihood that educated workers will be given preferential treatment in modern-sector job hiring; and (4) the recognition of labor turnover in a multiperiod urban framework and the likelihood of differential attitudes toward risk aversion among different migrants. He shows that each of these realistic extensions implies a *lower* equilibrium urban unemployment rate than that "predicted" by the simple Harris-Todaro expected wage gap model.

On the basis of his analysis, Fields suggests three additional policy variables beyond those suggested by Harris and Todaro and Bhagwati and Srinivasan that may have an important effect on the volume of unemployment and underemployment in LDCs (p. 185). These include (1) the establishment of rural and urban labor exchanges designed to minimize the need for migrants to engage in costly (private and social) job search and thus to reduce the size of the urban informal sector, lower open unemployment, and raise national output; and (2) the (somewhat curious) recommendation that "overeducation of the labour force might have the beneficial effect of both lessening urban unemployment and increasing national income in both the rural and the urban areas" (p. 185). This paradox arises because more highly educated workers are selected first, thus reducing the probability that less-educated workers will successfully secure a modern sector job and thereby, through lower induced migration, reducing the number of potential migrants by more than the number of jobs taken by the better educated (via the Todaro induced-migration multiplier). Unfortunately, Fields does not take into account the "social costs" of overeducation, especially in terms of foregone job opportunities. The variables also include (3) the suggestion that it is *job hiring* rather than *number* of jobs that primarily influence worker's locational decisions. Fields shows, therefore,

that “a small increase in the number of jobs has a much larger proportional effect on job hiring and induces substantial rural-urban migration and increases the rate of unemployment. Thus migration can be stemmed simply by not growing so fast” (p. 186). This last policy conclusion echoes the one in my original 1969 article but does not emphasize, as that article did, the concomitant importance of generating a more rapid rate of *rural* employment and output growth.

Conclusions

In spite of many significant modifications of the basic Todaro/Harris-Todaro model, it remains that its fundamental contribution—the idea that migration proceeds primarily in response to differences in “expected” urban and rural real incomes and that as a result of this the observed accelerated rates of internal LDC migration in the context of rising urban unemployment are not only a plausible phenomenon but in fact are entirely rational from the private “expected” income-maximization viewpoint of individual migrants—remains widely accepted as the “received theory” in the literature on migration and economic development (Fields 1975, p. 167; Jolly et al. 1973, pp. 13–16; Meier 1976, IV.C.1). This general acceptance at the “theoretical” level is reflected at the empirical level also by the widespread utilization of econometric migration functions that give explicit recognition to the “expected” income differential as one of the most important explanatory variables in the migration decision-making process. In the next section we look at this growing body of quantitative migration literature for a wide range of developing nations.

6.3 A Summary Review of Quantitative Migration Studies

Having set forth the general theoretical framework, we can now review and summarize the results of some completed migration studies. My main objective in this section is to determine what now seems to be known about migrant characteristics and the migration process in developing nations. This will allow us in the final section to delineate questions and issues that remain unanswered and therefore to suggest the most promising areas for future migration research.

6.3.1 Summary Results of the Nonrigorous Descriptive Literature

Our best sources of information on the range of *descriptive* migration literature for developing countries are the earlier comprehensive surveys by Brigg (1971, 1973), Carynyk-Sinclair (1974), and, most recently, those of Connell et al. (1975) and Lipton (1976). Descriptive literature on economic, sociological, and demographic migration for a wide range of countries in Latin America, Asia, and Africa was examined by Brigg,

Carynnyk-Sinclair, Connell, and Lipton, and on the basis of these and other surveys (e.g., Byerlee 1974) the following generalizations can be made.

Who Migrates?

As I pointed out earlier, migrants typically do *not* represent a random sample of the overall population. On the contrary, they tend to be disproportionately young, better educated, less risk-averse, and more achievement-oriented and to have better personal contacts in destination areas than the general population in the region of out-migration.⁸ In Africa, the problem of migrant "school leavers" is widespread (Byerlee 1974; Caldwell 1969; Rempel 1971). Although many migrants are unskilled, landless peasants, especially in Asia (Lipton 1976), many others possess job-transferable skills, have increasingly more years of schooling, and have some regular source of financial support for the period immediately following migration (Todaro 1971a; Barnum and Sabot 1975b; Schultz 1975). Although single men still appear to dominate the migration streams in Africa and Asia (Connell et al. 1975), married men (many accompanied by their families) and single women are now more prevalent in Latin American migration patterns (Brigg 1971; Herrick 1971).

Why Do People Migrate?

The overwhelming conclusion of almost all migration studies, both descriptive and econometric, is that people migrate primarily for economic reasons. The greater the difference in economic opportunities between urban and rural regions, the greater the flow of migrants from rural to urban areas. While distance is usually a significant intervening obstacle, its negative influence can be largely offset by sizable income differentials, especially for the more educated migrants (Barnum and Sabot 1975b; Schultz 1975; Lipton 1976).

In addition to the primary economic motive, people migrate (1) to improve their education or skill level (also ultimately an economic motive); (2) to escape social and cultural imprisonment in homogeneous rural areas; (3) to escape rural violence (Colombia) and political instability; and (4) to join family and friends who have previously migrated to urban areas. Few studies seem to support the often-heard hypothesis that migrants are attracted to cities in search of better entertainment or "bright lights."

What Are the Economic Effects of Migration on Source and Destination Areas?

The quantitative evidence necessary to begin to answer this most crucial of all questions is almost nonexistent in both the descriptive lit-

erature and most econometric studies. It is thus a major priority for future research. While there is no absence of hypotheses and conjectures about the relationship between migration and, say, rural development, such hypotheses are yet to be supported by anything more than casual empirical evidence (e.g., see Lipton 1976). As I pointed out earlier, internal migration was traditionally viewed as socially beneficent. Workers were shifted from low-productivity, labor-surplus source regions to high-productivity, labor-scarce destination areas. Seasonal migrants were able to supplement their incomes by short-term "circular" migration in accordance with seasonal variations in labor requirements (Elkan 1960, 1967). If real wages were imbalanced between two locations, the neo-classical price-adjustment model dictated that in-migration would work to restore the balance by raising rural average incomes and lowering urban wages.

More recently, internal migration has been viewed less sanguinely, especially with regard to its effects on rural productivity *and* income distribution (Lipton 1976). Rural-urban migration also appears to be accelerating in spite of rising levels of urban unemployment and growing numbers of "urban surplus" workers (Sabot 1975*b*). Rather than adjusting downward to rising unemployment, however, urban wage levels continue to rise, mostly as a result of institutional rather than competitive economic forces (see, for example, House and Rempel 1976 for evidence from Kenya). While most studies show that individual migrants appear to be behaving in a privately rational manner, many observers now believe that internal migration adversely affects the welfare of source areas (primarily rural) (see Lipton 1976; Connell et al. 1975; Schultz 1976; for a counterargument, however, see Griffen 1976). On the other hand, such migration seems to be contributing little, if anything, to expanded social welfare in destination areas (mostly urban) (Harris and Sabot 1976; Todaro 1976*c*). But, in spite of the growing acceptance of this "new view" of the contemporary relationship between internal migration and rural and urban development, little empirical evidence to convincingly support or refute this view can be gleaned from the descriptive migration studies reviewed in the Brigg, Sinclair, Connell, and Lipton surveys or in other descriptive studies. Clearly, more carefully designed econometric studies are required to test alternative hypotheses about the "net" social effects of internal migration on both source and destination areas.

We turn finally to the limited but growing number of technically sophisticated econometric migration studies that have recently begun to emerge to see if anything more can be learned.

6.3.2 A Survey of Recent Econometric Migration Literature

Yap (1975) has provided one of the most extensive reviews of the limited but growing econometric literature on internal migration in de-

veloping countries. The econometric studies examined by Yap cover Ghana (Beals, Levy, and Moses 1967), Kenya (Huntington 1974), and Tanzania (Barnum and Sabot 1975*b*) in Africa; Colombia (Schultz 1971), Brazil (Sahota 1968), and Venezuela (Levy and Wadycki 1972, 1973, 1974) in Latin America; Taiwan (Speare 1971) and India (Greenwood 1971*a,b*) in Asia; and Egypt (Greenwood 1969) in the Near East. More recently, the following studies (not included in the Yap survey) have been completed: Kenya (Knowles and Anker 1975; House and Rempel 1976); Tunisia (Hay 1974); Venezuela (Schultz 1975); Costa Rica (Carvajal and Geithman 1974); and Peru (Falaris 1976).

All the above are cross-sectional studies, although Barnum and Sabot utilize both cross-sectional and time-series data. Most explain point-to-point migration, usually between states or regions, although the studies by Barnum and Sabot, Huntington, Knowles and Anker, and House and Rempel deal specifically with rural-urban migration. All except the Taiwan and Tunisia studies consider aggregate flows between areas, and most utilized census data (again with the notable exceptions of Barnum and Sabot, Huntington, Knowles and Anker, and Hay). Most deal with male migration only.

With the exception of Hay's microprobability function for Tunisia explained earlier, all are "macro" migration functions. They typically are specified in logarithmic form, the basic general formulation being:

$$\frac{M_{ij}}{P_i} = f(Y_i, Y_j; U_i, U_j; Z_i, Z_j; d_{ij}; C_{ij}), \quad \begin{matrix} i = 1, \dots, n \\ j = 1, \dots, n \end{matrix}$$

where, as before,

$\frac{M_{ij}}{P_i}$ = rate of migration from i to j expressed in terms of the population in i

Y = wage or income levels

U = unemployment rates

Z = degree of urbanization

d_{ij} = distance between i and j , and

C_{ij} = friends and relatives of residents of i in destination, j .

A capsule description including regression results for the studies of Tanzania, Venezuela, India, and Kenya is given in table 6.1.

The following is a summary of the major findings of these studies.

The Importance of Income and Employment Differentials

As might be expected, all of the above-cited econometric work demonstrates once again the overwhelming importance of economic variables in explaining migratory movements. Differences in average income or

Table 6.1 Partial Income Elasticities, Migration Functions for Men: Selected LDCs

	Kenya Huntington (1974)	Tanzania Barnum and Sabot (1975a) ^b	Venezuela Levy and Wadycki (1972)	India Greenwood (1971a) ^c	Venezuela Schultz (1975) ^d
Dependent variable ^a	$\frac{M_{ij}}{P_i P_j}$	$\frac{M_{ij}}{P_i}$	$\frac{M_{ij}}{P_i}$	M_{ij}	$\frac{P_{ij}}{P_{ii}}$
Destination wage (W_j)	+6.79* (4.61)	+1.26*	+0.94* (2.59)	+0.56* (2.02)	1.83* (4.33)
Origin wage	-1.15* (2.69)	-0.56	-0.85* (2.32)	-1.24* (4.48)	-.857* (1.96)

Sources: Schultz (1975, table 5a); Yap (1975, table 3).

* $p \leq .05$.

^aDefinitions: M_{ij} : Migration from place i to j .

P_i, P_j : Population in place i, k , respectively.

^bBarnum and Sabot estimated a linear function, using lifetime earnings, undiscounted. The elasticities are calculated at the mean of the variables, using the income coefficients, .0024 (destination income), and -.0070 (origin income).

^cGreenwood's dependent variable is M_{ij} , rather than M_{ij}/P_i . However, the income coefficients would not change if his model were reestimated, using the rate M_{ij}/P_j ; for P_i , included on the right side of the equation, has a coefficient of approximately one. In other words, the income coefficient, α , is the same for

$M_{ij} = Y Z^{\beta} X P$ and $M_{ij}/P_{ij} = Y Z^{\beta} X$

^dSchultz's dependent variable estimated by OLS in his polytomous logistic model is the natural logarithm of the ratio of the migration probability or the gross

migration rate ($\frac{M_{ij}}{\sum_{j=1} M_{ij}}$) to nonmigrants, P_{ii} , used as the "numeraire."

wage levels between two places invariably turn up among the most important explanatory factors. When income levels are included as separate variables, migration is positively associated with the urban wage and negatively related to the rural wage. When urban-rural differentials are combined into a single variable, the rate of migration increases with the size of the differential.

The Importance of Job Probabilities and Urban Unemployment Rates

Perhaps even more important from a theoretical as well as a practical viewpoint is the finding in the studies by Levy and Wadycki, Carvajal and Geithman, and especially Barnum and Sabot, Knowles and Anker, Fields, Sapir, House and Rempel, and Schultz (for more educated migrants) that *the job probability variable appears to have "independent" statistical significance and to add to the overall explanatory power of the regressions when isolated from the relative or absolute income differential variable* (Levy and Wadycki 1972, p. 79; Carvajal and Geithman

1974, p. 121, n.13; Barnum and Sabot 1975a, pp. 17–18; Knowles and Anker 1975, pp. 17–21; Schultz 1975, tables 5c, 5d; House and Rempel 1976, p. 11; Sapir 1977; Fields 1979). Thus, for example, Barnum and Sabot, in the first really comprehensive and significant test of the Todaro hypothesis based on a carefully designed sample survey, find that “the addition to the explains sum of squares in moving from the specification without probability to the specification including probability as a separate variable is significant at a 99 percent confidence level” (Barnum and Sabot 1975a, p. 22).⁹ Moreover, when the wage and probability variables are combined to form an “expected” wage variable, the result is a definite improvement over the nominal wage rate in terms of the amount of variation explained. Levy and Wadycki obtained similar results for Venezuela (1972, p. 79), as did House and Rempel for Kenya (1976, pp. 11, 19), Sapir for Yugoslavia (1977, pp. 14–20), and Fields for Colombia (1979).

These studies provide preliminary support for the Todaro hypothesis of the importance of the “expected” wage in migration, at least for Tanzania, Kenya, Yugoslavia, Colombia, and Venezuela—the only countries where to my knowledge econometric studies have given explicit attention to a separate probability variable.¹⁰ It should also be pointed out, however, that Hay, in his study of migration in Tunisia, also confirmed the statistical significance of urban “expected” incomes, except that in Tunisia “urban earnings functions” in combination with proxy variables for urban expected income levels (schooling and level of skills) had to be utilized owing to the absence of actual urban income and employment rate data.¹¹

Urban Employment Expansion, Wage Differentials, Job Probabilities, and Induced Migration

Job Expansion and Induced Migration. An important hypothesis implicit in the original Todaro model and spelled out mathematically in the Harris-Todaro model concerns the “elasticity” of migration (the induced migration) response to changes in urban-rural wage differentials and urban employment probabilities. Todaro (1976b) has recently refined the concept and derived two simple formulas based on readily available migration, employment, and labor force statistics for estimating the conditions under which an autonomous increase in urban job creation designed to lower both levels and rates of urban unemployment may in fact lead to *increased* levels and rates of urban unemployment. The outcome is shown to depend on two “threshold” values of the elasticities of migration with respect to urban job probabilities—a threshold level related to the *amount* of unemployment and one related to the *rate* of urban unemployment. Using secondary data for fourteen Third World nations, I have estimated both threshold elasticities to be mostly

in the range $+0.20$ to $+0.60$, although the unemployment *rate* threshold elasticity is always higher than the unemployment level elasticity (Todaro 1976b, table 1).

In this latest paper, I argue that if the actual econometrically estimated migration—job probability elasticity is higher than either or both of these threshold values, an expansion of urban employment opportunities can be expected, through the mechanism of higher job probabilities inducing additional migration, to lead to either a higher level, a higher rate, or *both* a higher level and a higher rate of urban unemployment. For example, in Tanzania, Barnum and Sabot estimate a migration elasticity with respect to job probabilities of $+0.65$ (1975a, regression no. 8, p. 21), well above the “threshold” level of $+0.25$ calculated by Todaro (1976b, table 1). Thus, as a first approximation, we may conclude that, *ceteris paribus*, an autonomous expansion of urban employment growth in Tanzania would likely lead not only to higher levels but also to higher rates of urban unemployment.

Equations 14 and 15 and the illustrative computations reported in Todaro (1976b), therefore, offer LDC policy-makers a simple and convenient methodology using readily available data, for estimating, *as a first approximation*, the unemployment implications of policies designed to stimulate urban employment. Sapir has applied the formulation to the Yugoslavian economy and found it to be an accurate predictor (1977, p. 16).

Wage Differentials and Induced Migration. With regard to the influence of changing urban and rural wage levels on migration rates—that is, the migration elasticity with regard to urban and rural wage levels—the rate studies by Huntington, Knowles and Anker and by House and Rempel for Kenya, and by Greenwood for India, as well as that of Barnum and Sabot for Tanzania and those Levy and Wadycki and of Schultz for Venezuela provide some initial evidence of the possible values of these differential elasticities. First, with regard to the relative importance of urban job probabilities compared with urban wage rates, the Tanzania study estimates that a given percentage increase in urban wages will induce *twice* as much rural-urban migration as the same percentage increase in employment (Barnum and Sabot 1975a, table 4, regression 7), while the earlier Venezuela study predicts roughly the same effect for *interstate* migration (Levy and Wadycki 1972, table 1). Schultz, however, finds employment rate elasticities of migration more significant than wage elasticities for migrants with some secondary and higher education (1975, tables 5c, 5d).

Table 6.1 provides illustrative data from the five studies cited above for destination and origin income elasticities of migration. In the two rural-urban studies (Huntington 1974; Barnum and Sabot 1975a), the

urban wage elasticities are higher than the rural elasticities, indicating that rural incomes will have to rise faster than urban incomes simply to offset the migration effects of a given increase in urban incomes.¹² Levy and Wadycki's interstate regressions for Venezuela show little difference between origin and destination income elasticities, while Greenwood's results for India show that origin wages are twice as important as destination wages—the reverse of the Barnum and Sabot study for Tanzania and the Schultz results for Venezuela.¹³

Conclusions. Although this information provides us with the beginnings of a policy-relevant econometric approach to migration analysis, it is only a start. A major priority for future research focused on rural-urban migration and based on carefully collected field survey information along the lines suggested in section 6.3 is therefore a more scrupulous and detailed estimation of income and employment elasticities of migration for different countries at different points in time. From the policy point of view, a knowledge of such migration elasticities would go a very long way toward improving the empirical base from which effective wage employment and income policies designed to induce a more socially efficient spatial allocation of human resources can be formulated.

Differential Responsiveness of Population Subgroups and the Effects of Personal Contacts and Distance

The econometric literature in general supports most of the conclusions of the descriptive literature with regard to the differential responses of population subgroups to migration opportunities. More important, however, it provides quantitative estimates of the relative significance of these differential responses. The results can be summarized as follows:

1. At the time of migration, most migrants tend to be both younger and better educated than those who do not move. Even when age is controlled for, migration and education are positively correlated.

2. In Africa and South Asia, men predominate, although female migration is increasing, while in the more urbanized countries of Latin America there is a growing excess of women over men in the migration stream.

3. In each of the above cases—age, education, sex—economic motivations are paramount in the migration decision.

4. The relative abundance of urban services and amenities do not seem to exert an independent positive effect on migration. The evidence on this point, however, is very tentative and fuzzy, since none of the current econometric studies measures a migrant's utilization of urban services. Additionally, one must be careful when including an urban amenity variable to avoid difficulties of multicollinearity with other independent variables in the regression equation (e.g., wage levels, degree

of urbanization, population size, level of employment).

5. Almost all studies show a positive correlation between migration rates (or propensities to migrate, in the Tunisia study) and urban or state destination contacts in the form of friends and relatives. Such contacts can provide important information on job openings as well as lowering the effective costs of the job search by offering costless or low-cost accommodations to the migrant (Fields 1975). When contact variables are dropped from regression equations, however, the destination income elasticities remain significant and are reduced in size only slightly. Thus, the presence of friends and relatives, though representing positive factors in a migrant's decision to move, are not substitutes for economic incentives.

6. Finally, the negative effect of distance on migration, as predicted by traditional "gravity" models (Schultz 1976), is pronounced in most studies. Migrants tend to move to cities and towns in their own state or region, but they will move longer distances if the destination wages and employment opportunities are considerably higher (House and Rempel 1976, p. 14). More highly educated migrants are therefore likely to travel longer distances than those with less education.

Economic Benefits

With regard to the employment experience of migrants on arrival, their income gains, and their economic status relative to those born in urban areas, the following seems to summarize the evidence to date.

Private Returns. Migrants on the whole do appear to have increased their private (and/or household) welfare as a result of migration in spite of high and rising levels of unemployment (Yap 1975; Lipton 1976; Carvajal and Geithman 1974; Barnum and Sabot 1975*b*). By and large, many seem to have realized their private expected gains, although the proportion of "successful" migration appears to decline over time (Lipton 1976). A number find regular employment soon after arrival, and most seem to definitely improve their economic status over time. Quite a few start out in the informal sector before moving to formal-sector employment (Hay 1974). Many share their benefits with rural relatives through cash remittances (Connell et al. 1975; Johnson and Whitelaw 1972; Harris and Todaro 1970; Adepoju 1974; Sakdejeoyont 1973).¹⁴ As Yap notes, however, "the proportion who have difficulty in finding work is probably greater than the reported number. The surveys use retrospective information, and the failures who left the area would not be included in the surveys" (Yap 1975, p. 39).

Education and Income. The studies reported here all strongly support the hypothesis that the incomes of migrants are highly correlated with

education and skill level while being little associated with their status as migrants. To the extent, therefore, that migrants are more educated and have better skills than the average urban native, their incomes will be higher and their unemployment rates lower than urban nonmigrants.

6.4 Looking toward the Future: Priorities for Migration Research

Having carefully reviewed both the theoretical structure of existing migration models and the empirical information generated by the available descriptive and econometric literature, we are now in a better position to answer the question, "What do we still need to know about the internal migration process and its effect on economic development?" The delineation of this "knowledge gap" enables us to formulate a list of research priorities that then provide the foundation for a comprehensive worldwide research program focused on the causes and consequences of internal migration.¹⁵ The following is such a suggested list.

6.4.1 Migration and Development: Research Priorities

Although our general knowledge base on the characteristics of migrants and the migration process, especially the paramount nature of economic factors in the migrant's decision-making, is now well established, the literature on internal migration is just beginning to explore, albeit rather unsystematically, some of the really interesting and crucial issues surrounding the migration problem. The major "knowledge gaps" that remain to be carefully and systematically researched therefore include the following seven elements.

1. Migrant Perceptions, Expectations, and Experiences

How are migrant perceptions about job opportunities in potential destination areas formulated? Have their subjective perceptions been confirmed by experience and, if not, how can the information system about destination job opportunities be improved?¹⁶

2. Characteristics of Nonmigrants, Potential Migrants, and Return Migrants

We know little about the job histories of return migrants and only slightly more about why certain people or groups of people *do not* migrate. Better information generated by initial rural sample surveys followed up by urban "tracer" surveys would widen the net of migration studies to identify not only actual migrants but also nonmigrants, potential migrants, and return migrants. Comparative information on all four categories could greatly broaden our knowledge base about migrant and nonmigrant characteristics and the principal factors that influence mobility decisions.

3. *Importance of Job Probabilities and Expected Incomes*

In situations where there are positive income differentials between potential destination and source areas and an excess supply of labor in the destination area, does a separate probability variable related to destination unemployment (or, better, surplus labor) rates help to explain differentials in migration rates? In such situations, what are the "private," as compared with the "social," returns to migration? In short, do "expected" income differentials along the lines suggested in the Todaro models explain variations in migration rates and patterns better than simple "nominal" differentials? This crucial question needs to be researched carefully in future econometric studies.

4. *Wage and Job Probability Elasticities, Induced Migration, and Urban Unemployment*

Perhaps the most important parameters in need of careful estimation in future econometric migration studies, at least from a policy perspective, are the partial wage and job probability elasticities of migration. By generating empirical evidence on the relative size of the destination (urban) and source (rural) wage elasticities as well as the (mainly) destination job-probability elasticity both for individual countries and for a cross section of countries, general conclusions can be reached about the relative importance of wage and job creation policies in affecting the size and redirecting the flow of migration into more socially desirable patterns. The linkage between migration policy and general development policy can best be revealed by knowledge of how diverse development policies directly or indirectly affect urban and rural real incomes and job opportunities and therefore influence the magnitude and spatial distribution of national and regional populations. Such a formulation of the migration question underlines the important two-way linkages between demographic and economic variables as expressed, for example, in the ILO Bachue and other demographic-economic models (see, for example, Wery, Rodgers, and Hopkins 1974).

5. *The Short-term and Long-term Social and Economic Effect of Migration on Source and Destination Areas*

A major and persistent knowledge gap in internal migration studies in developing countries is the lack of detailed assessments of the social consequences of migration for both sending and receiving areas. In the case of internal rural-urban migration, the consequences of urban migration for rural source areas in terms of household income, productivity, and opportunity costs for different rural subgroups (e.g., educated and uneducated, small landholders, landless laborers, and peasant farmers as well as medium to large-scale landholders) needs to be carefully

assessed.¹⁷ On the other side of the coin, the consequences of internal migration for urban unemployment, the provision of housing, sanitation, health facilities, and other social services, the social, political, and psychic problems associated with urban congestion and slum development, and, finally, the relative effect of all these on the welfare of migrants as well as on urban-born residents needs to be carefully and systematically examined. In both cases, better knowledge of the flow of private transfer payments in the form of the inflow and outflow of cash remittances will give us a better picture of both the short- and long-run distributional effect of migration in terms of rural and urban household incomes. This is probably one of the most important areas for future research.

6. *The Relationship between Education and Migration*

Although it is well known that more education increases an individual's propensity to migrate, we are still unclear as to how much of this increased propensity can be explained *solely* by economic factors (i.e., more highly educated migrants have higher expected urban incomes owing both to higher wages and to greater employment probabilities—as demonstrated, for example, in Barnum and Sabot 1975a, table 1)—and how much is due to the effect of education on a rural individual's "world outlook." In other words, does education exert a non-economic *independent* effect on propensities to migrate? It may do this, for example, by altering a rural individual's overall utility function so that his "psychic" benefit/cost calculation of the private returns to migration works to reinforce his "economic" benefit/cost calculations. Those with more education, therefore, may have an "acquired" personality factor that causes them to respond disproportionately to non-economic as well as to economic incentives to migrate. Carefully designed survey questionnaires and well-structured econometric models can help us separate out these different effects of education.

7. *Migration, Income Distribution, and Population Growth*

The relationship between migration and income distribution on the one hand and migration and fertility on the other is probably among the least explored, yet potentially most significant areas of migration analysis within the broader context of economic and social development. Migration can have a direct effect on social welfare by altering the pattern of rural income distribution (Lipton 1976) and thereby indirectly affecting the level of national fertility and future population growth (Kuznets 1964). Although the effect of migration on the spatial distribution of existing populations is a crucial issue, its influence on future population growth remains unexplored. There are a number of reasons, however, why we might expect migration to influence the geographical pattern and rate of population growth. First, migration affects the pat-

tern of income distribution in rural and urban areas, and income distribution is thought to be an important determinant of aggregate population growth (Rich 1973). In general, for any level of per capita GNP, countries with a more egalitarian distribution of income tend to have lower fertility rates (Repetto 1974), mainly as a result of the widened range of choice that higher incomes more equitably distributed bring to peasant families (Kuznets 1964).

Unfortunately, in spite of some valuable recent descriptive studies such as those of Connell et al. and Lipton, cited earlier, the relationship between migration and rural (as well as urban) income distribution is little understood. While migration may improve the private or even the household economic status of individual migrants (Griffen 1976), it is not clear what its "net" effects are on *aggregate* rural incomes and production. Since migration is selective of the younger, more able-bodied, better educated rural dweller, on balance the rural sector as a whole may stagnate as a result of the rapid depletion of its most dynamic human resources (Schuh 1976). While individual families may be made better off, the sector as a whole may be made worse off. As a result, high rural fertility rates may be indirectly reinforced by the out-migration of the most talented elements. On the other hand, if economic incentives and higher income-earning opportunities were promoted in rural areas, there might be the fourfold beneficial effect of lower rates of out-migration, less urban unemployment, higher rural incomes, and potentially lower levels of rural fertility.¹⁸

All of this obviously is very speculative ad hoc theorizing. But I hope it does suggest that a broader perspective on the relationship between migration, income distribution, and population growth is in order. Future theoretical and empirical research on migration should begin to focus explicitly on this relationship as well as on the other issues outlined above.

Notes

1. See, for example, Todaro (1968, 1969, 1971*b*, 1976*a*), and Harris and Todaro (1970).

2. For an empirical verification of this hypothesis, see, among other studies, Hay (1974, table 4.7, p. 78) for Tunisia and Carvajal and Geithman (1974, p. 110) for Costa Rica.

3. Clearly, the final decision will be influenced by migrant attitudes toward risk and uncertainty. Different migrants might react differently to the *same* expected urban income depending on whether the probability of success is high or low; that is, a 90% chance of 100 urban income units might be perceived as more desirable than, say, a 50% chance of earning 180 units. We will explore this issue further

in section 6.3 when we analyze various econometric migration studies.

4. The Hay (1974), Barnum and Sabot (1975*b*), and Oberai (1975) studies, among others, provide evidence that migrant urban incomes tend to rise rapidly over time, especially during the first few years after moving.

5. Clearly, the present value equation should be disaggregated further by age, education, and sex as well as by regions of origin and destination, since both wage levels and job probabilities are likely to vary for migrants with differing demographic and educational characteristics (see below).

6. A number of critics seem to have misread my original article by asserting that I failed to take into account the existence of an urban "traditional" or "informal" sector by assuming that a migrant would be either employed in the modern sector or openly unemployed. But see Todaro (1969, p. 139, n. 3; 1972, pp. 49–51). Admittedly, however, there is some ambiguity, and the implications of informal activities were not fully drawn out (see Fields 1975).

7. For a more detailed discussion of theoretical modifications see Todaro (1976*c*, pp. 32–46).

8. For historical evidence of this point from developed countries, see Kuznets (1964).

9. In his study of Kenyan migration, Rempel (1971) set out to test the Todaro model and found no independent significance for the expected "wage" differential, or for that matter for the urban wage per se, which in some regressions even had a negative sign! But, as pointed out earlier, Rempel's study surveyed only urban migrants, did not deal effectively with estimations of rural or urban incomes, had a statistically inadequate specification of the job probability variable, and in general suffered from a number of other methodological weaknesses. To this extent it was not a real test of the Todaro model. However, the more recent paper by House and Rempel (1976) as well as that by Knowles and Anker (1975), based on a more thorough sample survey of 1,074 Kenyan households in seven of Kenya's eight provinces, provide detailed support for the expected-income hypothesis.

10. Schultz's later (1975) study of Venezuela using the same 1961 census data as Levy and Wadycki finds the probability variable significant only for more educated migrants, while Falaris's study of Peru, which also includes an employment rate variable, reveals insignificant coefficients with the wrong sign. Falaris, however, points out that his results are flawed by census data measurement problems as well as simultaneity difficulties.

11. In their study of Soviet rural-urban migration, Stuart and Gregory use the "tightness of the urban labour market" as a proxy variable for urban job probabilities and find it to be an "important explanatory variable" (Stuart and Gregory 1974, p. 24).

12. Not much credence should be placed on Huntington's urban and rural elasticity parameters, since they are derived from Rempel's income data, which, as we have seen above, are deficient from a number of viewpoints. See, however, Knowles and Anker and House and Rempel for more credible results for Kenya.

13. The Schultz and the Levy and Wadycki studies illustrate one of the main problems of current econometric migration research—the limited comparability of results, even those using the same data base, because of different definitions and specifications of dependent (but also independent) variables. Clearly, the standardization of these definitions and the adoption of more comparable measurement and estimation procedures is a prerequisite for meaningful cross-country as well as intracountry comparisons.

14. A number of investigators, however, report substantial reverse (rural-urban) remittances (Connell et al. 1975), and in some cases it is argued that total rural

out-remittances plus migrant's education costs greatly exceed in-remittances (Essang and Mabawonky 1974).

15. Two major cross-country migration research projects are currently being carried out by the Population and Employment Division of the International Labor Organization and the Employment and Rural Development Division, Development Economics Department, of the World Bank.

16. Gugler (1974) argues for the use of employment exchanges and recruiting offices in rural areas along the lines of the Mexican *bracero* program to improve migrant information systems (see also Fields 1975, p. 185, for a similar proposal).

17. For suggestions of research priorities linking internal migration to rural productivity and inequality see Lipton (1976) and Schuh (1976).

18. For a survey of the literature on labor policy and fertility in developing countries, see Ridker and Nordberg (1976).

Comment Gary S. Fields

All of us who study labor market and population problems in less developed countries and their interaction via migration are indebted to Michael Todaro for the intellectual guidance he has provided over the last decade. Before he arrived on the academic scene, it was widely thought that urban unemployment in poor countries could be alleviated or even eliminated if governments could only channel enough resources and incentives to create more urban jobs. Todaro showed the futility of this kind of strategy, pointing out that more urban jobs would accelerate rural-to-urban migration and result in more rather than less unemployment. Todaro's call for development strategies emphasizing rural growth has been heeded and is now widely accepted. I cannot begin to estimate the impact of this shift on the economic well-being of the poor throughout the world.

I also owe Todaro a personal debt. When I first arrived in Kenya in 1970 to begin to study economic development, Todaro had just left. The halls of the Institute for Development Studies at the University of Nairobi (and, I am told, the inner channels of the Kenyan government as well) were alive with the excitement his ideas had generated. His influence on academicians and policy-makers was evident. As a young graduate student, Todaro's influence gave me hope that some day I too might be able to contribute to the economic betterment of the poor around me, whose plight I was just then beginning to grasp.

It is a privilege to discuss Todaro's paper. The material is presented clearly, succinctly, and fairly. Todaro claims credit where he has earned

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it, gives credit where it is due, and withholds credit where it is not due. On the whole, the resulting document is an accurate survey, valuable both to practitioners in the field and to newcomers.

The survey is organized into three sections: toward a testable theory; review of empirical findings; and major unresolved questions. My remarks are organized accordingly.

Toward a Migration Theory

Section 6.2 contains a valuable summary of the Todaro model in its several variants and a number of subsequent modifications. Particularly apt is the summary of the four essential features of this class of models and the assessment of the current state of thinking. The reader is thereby introduced to the main ideas in their original and current developments. On the whole, I am in agreement with the points made in this section.

The expected-income hypothesis (alternative versions of which are set forth in Todaro (1969) and Harris and Todaro (1970) admits of two interpretations. Some, apparently including Todaro himself, see it as a *literal* representation of the functioning of labor markets in LDCs, or at least as a tolerably close first approximation. Others prefer to regard the expected-income hypothesis as the *central characteristic* of a suitably embellished model. I myself prefer the latter interpretation.

In a recent paper (Fields 1975) to which Todaro makes several references in his survey, I addressed the apparent discrepancies between some of the Todaro model's assumptions and predictions, on the one hand, and real-world complexities and data, on the other. Specifically, I dealt with the gap between LDC unemployment rates and the rates predicted by a literal interpretation of the Harris-Todaro model (Harris and Todaro 1970). I hoped to show that the disparity could be reconciled within the Harris-Todaro framework, appropriately augmented. As I concluded from my analysis (Fields 1975, p. 184): "These extensions permit us to retain the quite plausible notion, as set forth by Harris and Todaro, that the voluntary movement of workers between geographical areas is the primary equilibrating force in the labor markets of LDCs, while at the same time having a theory which is not contradicted by the facts." Thus, I interpreted the Harris-Todaro model as being incomplete, not incorrect. For empirical research, it is crucial to work with as complete a model as is practicable. I will say more on this below.

Let me mention some other, less fundamental points where I differ with Todaro:

1. I am puzzled by Todaro's claim in note 6 that he took into account the urban "traditional" sector in his 1969 paper. The footnote to which he refers (1969, p. 139, n. 3) shows his awareness of the existence of

this sector, but this awareness is not carried over into the formal analytics. I suppose we have a semantic disagreement over what it means to take something into account.

2. In his 1969 paper and again in this paper, Todaro claims that the rising probability of employment is consistent with longer-term migrants having better contacts and information. I think he is a bit misleading on this point. In his model the rising probability of employment is the result of a cumulative job search process with infinite job fixity in which the transition probability π is constant. The rising probability of being employed refers to the *state* probability. It does *not*, as Todaro suggests, result from the *transition* probability increasing with length of time in the city due to better contacts (i.e., rising $\pi^i(t)$ at time t for migrant cohort i).

Review of Quantitative Studies

Section 6.3 reviews the major empirical findings from the migration literature. He brings together the results of a large number of studies, including several that are as yet unpublished. I found his distinction between “nonrigorous descriptive” studies as opposed to “econometric studies” a bit artificial and the choice of terminology rather unfortunate, but his conclusions generally are clearly reasoned and are well documented where possible. Where studies of only a few countries support a given conclusion, this lack of solid support is duly noted. As a survey, then, this section is a fine capsule summary of the existing literature.

In this section, I wish Todaro had adopted a more critical stance in evaluating the various studies. Strong and weak studies are given equal weight. The studies differ greatly, however, in conceptual clarity, data suitability, statistical method, and sophistication in interpreting the findings. In some respects, therefore, the evidence is weaker than Todaro implies.

I would also like to have seen a prescriptive statement of how to go about conducting empirical migration research relevant to the Todaro model. As my own past research on migration in the United States has shown (Fields 1976), even if one takes the view that economic factors are primarily responsible for migration behavior, *which* economic variables are included and *how* they are specified makes a great difference in the explanatory power of the economic model. My colleague T. Paul Schultz has recently undertaken an extensive formal analysis of this question (Schultz 1976). I raise this point because I find it very difficult to ascertain what Todaro would regard as an appropriate “test” of “the Todaro model.” Does statistical significance of an unemployment rate variable in a migration function constitute sufficient supporting evidence? Or does verification of the theory demand more, such as observing the same elasticity of migration with respect to employment proba-

bility as with respect to the wage rate? I looked in vain through Todaro's survey and his other writings for guidance on just how literally to take the model, on which propositions are critical and which result from a specific mathematical formulation, and on what evidence would be conclusive in supporting or refuting these propositions. I await a statement from Todaro clarifying his position on these issues.

Another concern I have is with Todaro's skeptical conclusion about the consequences of rural-urban migration. Todaro states his own position clearly: "migration substantially in excess of new job opportunities is both a symptom of and a factor contributing to Third World underdevelopment." Symptom, yes. But contributing factor? I am unconvinced and truly agnostic. These are contentious issues. As Todaro makes clear in section 6.3.1, the evidence is speculative and inconclusive. I would have liked to have seen more discussion of the positions on both sides.

One other point bothers me. In section 6.3.2 Todaro describes a procedure he has devised in his most recent work (1976*b*) for estimating the elasticities of migration with respect to urban employment opportunities and rural-urban wage differentials. Todaro contends that the suggested procedure, although not ideal, is useful "as a first approximation" to the magnitudes in question. Frankly, I doubt the validity of this approximation. We should note that the formulas upon which the estimated elasticities are based are derived from the literal Todaro model of 1969. Consequently, these estimates make no allowance for labor force heterogeneity, job search by currently employed persons, or the other real-world complications recognized earlier in the survey. Thus, Todaro does what he cautioned us against earlier: he takes his own theoretical model literally in empirical work. Indeed, the Harris-Todaro model, taken literally, gives an equilibrium urban unemployment rate of one minus the rural-urban wage ratio, or roughly $\frac{2}{3}$, well outside the range of tolerance as a "first approximation," which is why we need an enriched model in the Harris-Todaro tradition. Might not Todaro's recent calculations of the employment and wage elasticities be in error by a similar amount? This is more than an academic point, since there are evident dangers in basing policy on parameter estimates as imprecise as these seem to be.

Priorities for Migration Research

The list of research issues posed by Todaro in section 6.4 contains the major unanswered questions, including those for which tentative answers are available for only a small number of countries. If we had answers to all these questions, we would have a much better understanding of the migration process and a much better sense of what policy direction to move in.

Of the topics mentioned on Todaro's list, in my judgment two merit highest priority. One is the empirical validation of the expected-income model in predicting migration patterns. The conceptual propositions set forth by Todaro (1969) and Harris and Todaro (1970) some seven or eight years ago have not received sufficient empirical documentation in many areas. More diligent empirical research lies ahead.

The other high-priority research need is for studies of the consequences of migration for the migrants themselves and for the economies of the sending and receiving areas. I welcome the concern voiced by Todaro and others for the income distributional effects of migration as well as the overall efficiency effects. In bringing these concerns to bear, though, let me voice a general caveat. It is quite possible that overall income distribution may improve with migration even though both the urban and rural distributions appear to worsen; this would follow if, as seems to be the case, migrants were in relatively favorable positions in the rural areas before their move but enter the urban labor market at a relative disadvantage, at least in the short run. The caveat, then, is that income distribution concerns must reflect changes in the entire economy, using tools of analysis that are sensitive to changing numbers of persons in the urban and rural sectors of a dual economy. The usual measures of income distribution within the urban and rural sectors taken separately may not suffice.

In sum, Michael Todaro has prepared a valuable synthesis of the conceptual framework and empirical research on migration in less developed countries. The paper stands as an authoritative statement of where the migration field is and where it is going. The careful reader will observe not only how much is known about this important facet of economic development but also how little. As yet unanswered are key questions such as the role of migration in promoting or impeding economic growth and alleviating poverty and the extent of responsiveness of LDC workers to differential employment and earnings opportunities in present and alternative locations. Much remains to be done.

Comment Robert J. Willis

More than anyone else, Michael Todaro is responsible for the currently prevailing explanation of the coexistence of high urban unemployment rates and substantial inflows of rural migrants to urban areas in the

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Third World. This explanation, embodied in the Todaro and Harris-Todaro models, has led to a radical shift in the opinion of most economists concerning the desirability of rural-to-urban migration in the developing countries and of policies designed to generate growth in urban employment opportunities.

Traditionally, migration is viewed as one among a number of economic mechanisms that reallocate resources from uses with relatively low value to those with higher value, thereby promoting economic efficiency and growth. Rural-to-urban migration clearly played this role in the economic development of the Western countries and was expected by many economists to play a similar role in the Third World. Today, however, Todaro argues that such migration is viewed as "*the* major contributing factor to the ubiquitous phenomenon of urban surplus labor and as a force that continues to exacerbate already serious urban unemployment problems caused by growing economic and structural imbalances between urban and rural areas" (Todaro, section 6.1, my emphasis). The basis for this judgment is provided by what has come to be known as the "Todaro hypothesis." In this paper Todaro reviews his theory, recent extensions and modifications of it, and the empirical evidence that has been brought to bear on internal migration in the less developed countries.

In important respects, the Todaro model is more a model of how labor markets operate in LDCs than it is a model of migration as such. In particular, the spatial aspects of the model do not seem crucial. For example, Mincer¹ uses a very similar model to analyze the employment and unemployment effects of minimum wage laws in the United States. He divides the economy into "covered" and "uncovered" sectors that parallel Todaro's urban and rural sectors, except that Mincer's sectors are defined according to statute while Todaro's are defined spatially. Of course the key feature that distinguishes the sectors in each model is the assumption that wage rates are fixed exogenously in one sector and are free to fluctuate with supply and demand in the other sector. Both Mincer and Todaro close the model by assuming that excess supplies of labor in the "covered" sector are probabilistically rationed and that individual supply conditions are governed by a comparison of expected wages in the two sectors.

It is interesting to note that Mincer finds that an increase in the minimum wage causes labor to leave the covered sector in the United States, while Todaro argues that policies designed to raise modern-sector wages above the competitive level are a major cause of labor inflow into urban areas in LDCs. In their respective contexts, as Mincer notes, both arguments may be correct. In particular, increases in the covered-sector wage are more likely to generate inflows of labor to the covered sector, the more rapid the growth of labor demand in that sector. Rapid de-

mand growth may be more characteristic of the covered sector in developing countries than it is in the United States.

Two assumptions—exogenous (or downwardly rigid) modern-sector wages and probabilistic job rationing—are chiefly responsible for Todaro's conclusion that privately rational decisions to migrate to urban areas generate important social losses through urban unemployment or underemployment. Given the importance of these assumptions, Todaro devotes surprisingly little attention in this survey to their empirical validity or theoretical justification.

Consider first the question of rigid wages. Although he asserts that real urban wages have proved to be inflexible downward throughout the Third World, Todaro offers no evidence for this assertion. Nor does he elaborate on the sources of rigidity or define the scope of the "covered sector" in terms of the industries and occupational or skill categories for which the rigidity holds. My concern here is not that Todaro may be wrong in his assertion that wage rigidities are extremely important in LDCs. Rather, it seems to me that empirical tests of the Todaro model and discussions of its policy implications could benefit substantially from a more careful and precise consideration of these issues. For example, it is clear that a uniform minimum wage law impinges most severely on the least skilled workers, while artificially high wages for government bureaucrats are likely to affect the best educated portion of the population. In the former case, the achievement of market equilibrium is likely to involve the migration of unskilled workers from rural areas. In the latter case, equilibrium will probably not induce substantial rural-to-urban migration. Rather, the clearing mechanism more likely involves excessive investment in higher education by the urban middle class and the creation of an underemployed intelligentsia.

From a policy perspective, one of the most important contributions of Todaro's model is to remind us that artificially elevated wages may involve two sources of welfare loss. The first, most familiar source of loss is the misallocation of resources between the covered and uncovered sector caused by the distortion of the wage structure. Note that this distortion implies that the modern sector work force is smaller than optimal regardless of whether the high wage causes a net inflow or outflow of labor to the urban area. If there is a net inflow, the rural labor force is also smaller than optimal.

A second loss, emphasized in the Todaro model, arises because the use of time by unemployed or underemployed workers waiting to be selected for a high wage in the job lottery is socially unproductive. This type of loss is better known in other areas of economics as rent dissipation, a phenomenon that arises when property rights in a scarce resource are not well defined. The difference between the wage of a worker in the modern sector and his alternative wage is a rent to his job, which is an

artificially scarce resource. If the worker "owned" his job, he would sell the right to occupy it to another individual for an amount equal to the present discounted value of this rent. Clearly, an organized market in job rights would eliminate the second type of inefficiency by eliminating unemployment as a market-clearing device. It is also clear that, apart from wealth effects, the same allocation of labor would be achieved whether the "owner" of the job were the employee, the employer, a foreman, a union, a government official, or such.

The job lottery assumed by Todaro results in at least a partial dissipation of scarcity rents on modern-sector jobs (if workers are risk-neutral and in perfectly elastic supply to the modern sector, the dissipation will be complete). The essence of the Todaro hypothesis seems, therefore, to be a contention that none of the economic or political actors mentioned above has managed to acquire sufficient control of the disposition of rights to modern-sector jobs to be able to capture the profits from such rights. While organized markets in job rights are doubtless rarely observed, I suspect that nepotism, bribery, union entry fees, and a myriad of similar practices are not unknown as job allocation mechanisms in LDCs. To the extent that such practices enable scarcity rents on modern-sector jobs to be captured, the existence and growth of a high-wage modern sector will fail to explain the high levels of urban unemployment in LDCs.

As a final comment, I must express my puzzlement about the failure of Todaro and others to explore the feasibility of policies to deal directly with rigid modern-sector wages. If feasible, elimination of such rigidities would surely represent a first best solution to the problems stressed by Todaro of misallocation of labor between urban and rural sectors and the social losses caused by unemployment or underemployment. Even if rigidities ultimately prove immune to policy, serious research on this issue may be useful in clarifying the workings of the urban labor market in LDCs and the nature of social, economic, and political constraints on its operation.

Note

1. Jacob Mincer, "Unemployment effects of minimum wages," *Journal of Political Economy* 84, no. 4, part 2 (August 1976): S87-104.

References

Adepoju, A. 1974. Rural-urban socio-economic links: The example of migrants in southwest Nigeria. In *Modern migrations in western Africa*, ed. J. Arnin. London: Oxford University Press.

- Barnum, H. N., and Sabot, R. H. 1975a. Education, employment probabilities and rural-urban migration in Tanzania. Paper presented at 1975 World Congress Econometric Society.
- . 1975b. *Migration, education and urban surplus labor*. Paris: OECD Development Center, Employment Series.
- Beals, R. E.; Levy, M. B.; and Moses, L. N. 1967. Rationality and migration in Ghana. *Review of Economics and Statistics* 49(4): 480–86.
- Bhagwati, J., and Srinivasan, T. 1974. On reanalyzing the Harris-Todaro model: Rankings in the case of sector specific sticky wages. *American Economic Review* 64: 502–8.
- Brigg, P. 1971. Migration to urban areas. International Bank for Reconstruction and Development Staff Working Paper no. 107.
- . 1973. Some economic interpretations of case studies of urban migration in developing countries. IBRD Staff Working Paper no. 151.
- Byerlee, D. 1974. Rural-urban migration in Africa: Theory, policy and research implications. *International Migration Review* 8, no. 4: 543–66.
- Caldwell, J. C. 1969. *African rural-urban migration*. Canberra: Australian National University Press.
- Carvajal, M. J., and Geithman, D. T. 1974. An economic analysis of migration in Costa Rica. *Economic Development and Cultural Change* 23(1): 105–22.
- Carynyk-Sinclair, N. 1974. Rural to urban migration in developing countries, 1950–70: A survey of the literature. ILO Working Paper WEP-2-19.
- Connell, J.; Dasgupta, B.; Laishley, R.; and Lipton, M. 1975. Migration from rural areas: The evidence from village studies. University of Sussex, Institute of Development Studies, Discussion Paper no. 39.
- Cordon, W. M., and Findlay, R. 1975. Urban unemployment, intersectoral capital mobility and development policy. *Economica* 42:165, 59–78.
- Elkan, W. 1960. *Migrants and proletarians*. London and New York: Oxford University Press.
- . 1967. Circular migration and the growth of towns in East Africa. *International Labour Review* 96(6): 581–89.
- Essang, S. M., and Mabawonky, A. F. 1974. Determinants and impact of rural-urban migration: A case study of selected communities in western Nigeria. Department of Agricultural Economics, Michigan State University, African Rural Employment Program, no. 10.
- Falaris, E. M. 1976. The determinants of internal migration in Peru: An economic analysis. University of Minnesota, Department of Economics (mimeographed).

- Fei, J. C. H., and Ranis, G. 1961. A theory of economic development. *American Economic Review* 51: 533–65.
- Fields, G. 1975. Rural-urban migration, urban unemployment and underemployment, and job search activity in LDC's. *Journal of Development Economics* 2(2): 165–88.
- . 1976. Labor force migration, unemployment, and job turnover. *Review of Economics and Statistics* 58 (November): 407–15.
- . 1979. Lifetime migration in Colombia: Tests of the expected income hypothesis. *Population and Development Review*, vol. 5 (June).
- Greenwood, M. 1969. The determinants of labor migration in Egypt. *Journal of Regional Science* 9(2): 283–90.
- . 1971a. An analysis of the determinants of internal labor mobility in India. *Annals of Regional Science* 5(1): 137–51.
- . 1971b. A regression analysis of migration to urban areas of a less-developed country: The case of India. *Journal of Regional Science* 11(2): 253–62.
- Griffen, K. 1976. The impact of migration from rural areas: Comments on Michael Lipton's paper. Paper presented at Research Workshop on Rural-Urban Labor Market Interactions, International Bank for Reconstruction and Development, Washington, D.C.
- Gugler, J. 1974. Migrating to urban centers of unemployment in tropical Africa. Paper presented at Eighth World Congress of Sociology, Toronto.
- Harris, J., and Sabot, R. 1976. Urban unemployment in LDC's: Towards a more general search model. Paper presented at Research Workshop on Rural-Urban Labor Market Interactions, International Bank for Reconstruction and Development, Washington, D.C.
- Harris, J., and Todaro, M. 1970. Migration, unemployment, and development: A two-sector analysis. *American Economic Review* 60(1): 126–42.
- Hay, M. J. 1974. An economic analysis of rural-urban migration in Tunisia. Ph.D. diss., University of Minnesota.
- Herrick, B. 1965. *Urban migration and economic development in Chile*. Cambridge: Massachusetts Institute of Technology Press.
- . 1971. Urbanization and urban migration in Latin America: An economist's view. In *Latin American urban research*, ed. F. Rabino-vitz and R. Trueblood, vol. 1. Beverly Hills, Calif.: Sage Publications.
- House, W. J., and Rempel, H. 1976. Labour market pressure and wage determination in less developed countries: The case of Kenya. Department of Economics, University of Nairobi (mimeographed).
- Huntington, H. 1974. An empirical study of ethnic linkages in Kenyan rural-urban migration. Ph.D. diss., SUNY/Binghamton.

- International Labour Office. 1969. *Employment policy in Africa*. Report IV(1). Third Accra: Africa Regional Conference.
- Johnson, G. 1971. The structure of rural-urban migration models. *East African Economic Review* 3: 21–28.
- Johnson, G., and Whitelaw, W. E. 1972. Urban-rural income transfers in Kenya: An estimated remittance function. Institute of Development Studies, University of Nairobi, Kenya (mimeographed).
- Jolly, R. 1970. Rural-urban migration: Dimensions, causes, issues and policies. Conference on Prospects for Employment Opportunities in the Nineteen Seventies, Cambridge University.
- Jolly, R.; De Kadt, E.; Singer, H.; and Wilson, F. 1973. *Third World Employment and Strategy*. Middlesex: Penguin Education.
- Knowles, J. C., and Anker, R. 1975. Economic determinants of demographic behaviour in Kenya. ILO, Population and Employment, Working Paper no. 28.
- Kuznets, S. 1964. Introduction: Population redistribution, migration and economic growth. In *Population redistribution and economic growth, United States, 1870–1950*, ed. H. T. Eldridge and D. S. Thomas. Philadelphia: American Philosophical Society.
- . 1971. *Economic growth of nations*. Cambridge: Harvard University Press.
- Levy, M., and Wadycki, W. 1972. A comparison of young and middle-aged migration in Venezuela. *Annals of Regional Science* 6(2): 73–85.
- . 1973. The influence of family and friends on geographic labor mobility: An international comparison. *Review of Economics and Statistics* 55(2): 198–203.
- . 1974. What is the opportunity cost of moving? Reconsideration of the effects of distance on migration. *Economic Development and Cultural Change* 22(2): 198–214.
- Lewis, W. A. 1954. Economic development with unlimited supplies of labour. *Manchester School of Economics and Social Studies* 20: 139–92.
- Lipton, M. 1976. Migration from rural areas of poor countries: The impact on rural productivity and income distribution. Paper presented at Research Workshop on Rural Labor Market Interactions, International Bank for Reconstruction and Development, Washington, D.C.
- Meier, G. M. 1976. *Leading issues in economic development*. 3d ed. London: Oxford Press.
- Oberai, A. S. 1975. An analysis of migration to Greater Khartoum (Sudan). ILO-WEP, Population and Employment, Working Paper no. 19.

- Rempel, H. 1971. Labor migration into urban centers and urban unemployment in Kenya. Ph.D. diss., University of Wisconsin.
- Repetto, R. 1974. The interaction of fertility and the size distribution of income. Research Paper no. 8, Center for Population Studies, Harvard University.
- Rich, W. 1973. *Smaller families through social and economic progress*. Washington, D.C.: Overseas Development Council.
- Ridker, R. G., and Nordberg, O. S. 1976. Labour policy and fertility in developing countries. ILO, Population and Employment, Working Paper no. 30.
- Sabot, R. H. 1975. The meaning and measurement of urban surplus labor. International Bank for Reconstruction and Development (mimeographed).
- Sahota, G. S. 1968. An economic analysis of internal migration in Brazil. *Journal of Political Economy* 76(2): 218-45.
- Sakdejyont, Y. 1973. *Village life near Bangkok*. Kyoto: Center for Southeast Asian Studies, Kyoto University.
- Sapir, A. 1977. The Todaro hypothesis for internal migration: A case study for Yugoslavia 1954-1972. Department of Political Economy, Johns Hopkins University (mimeographed).
- Schuh, G. E. 1976. Out-migration, rural productivity and the distribution of income. Paper presented at Research Workshop on Rural-Urban Labor Market Interactions, International Bank for Reconstruction and Development, Washington, D.C.
- Schultz, T. P. 1971. Rural-urban migration in Columbia. *Review of Economics and Statistics* 53(2): 157-63.
- . 1975. The determinants of internal migration in Venezuela: An application of the polytomous logistic model. Paper presented at Econometric Society World Congress, Toronto.
- . 1976. Notes on the estimation of migration decision functions. Paper presented at Research Workshop on Rural-Urban Labor Market Interactions, International Bank for Reconstruction and Development, Washington, D.C.
- Speare, A., Jr. 1971. A cost-benefit model of rural to urban migration in Taiwan. *Population Studies* 25(1): 117-30.
- Stuart, R. C., and Gregory, P. R. 1974. A model of Soviet rural-urban migration. University of Texas, Austin (mimeographed).
- Todaro, M. P. 1968. An analysis of industrialization, employment and unemployment in LDC's. *Yale Economic Essays* 8(2): 329-402.
- . 1969. A model of labor migration and urban unemployment in less developed countries. *American Economic Review* 59(1): 138-48.

- . 1971a. Education and rural-urban migration: Theoretical constructs and empirical evidence from Kenya. Paper presented at a Conference on Urban Unemployment in Africa, Institute for Development Studies, University of Sussex.
- . 1971b. Income expectations, rural-urban migration and employment in Africa. *International Labour Review* 104(5): 387–414.
- . 1976a. Rural-urban migration, unemployment and job probabilities: Recent theoretical and empirical research. In *Economic factors in population growth*, ed. Ansley J. Coale, pp. 367–86. Proceedings of an International Economics Association conference at Valescure, France. London: Macmillan.
- . 1976b. Urban job expansion, induced migration and rising unemployment: A formulation and simplified empirical test for LDC's. *Journal of Development Economics* 3(3): 211–25.
- . 1976c. *Internal migration in developing countries*. Geneva: International Labor Organization.
- Wery, R.; Rodgers, G. B.; and Hopkins, M. D. 1974. A population and employment model for the Philippines. ILO-WEP 2-21, Working Paper no. 5.
- Yap, L. 1975. Urban task force paper. International Bank for Reconstruction and Development (mimeographed).