

INTERNAL MIGRATION IN DEVELOPING COUNTRIES

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1. Introduction: outline and patterns

1.1. Focus and outline of the review

It is 20 years since Simmons, Diaz-Briquets and Laquian wrote:

The movement of peoples in developing countries has been intensively studied, and in recent years the results of these studies have been thoroughly reviewed. One needs good justification for preparing yet another review... (Simmons et al., 1977: p. 5).¹

However in the last decade, a substantial literature on the economics of internal migration in the developing countries has appeared, and on this the present review focusses. This literature encompasses theoretical contributions which, not surprisingly, have moved in parallel with the broader evolution of mainstream microeconomic theory: from simple human capital models with known alternative opportunities, through treatment of uncertainty and search, to asymmetric information and strategic behavior. The associated empirical evidence undoubtedly lags behind, yet at least some strands have been subjected to extensive and increasingly sophisticated testing. Meanwhile policy issues have remained at the fore, and experiences with migration related policies have received much attention in the literature of recent years.

This chapter reviews some of the principal contributions addressing each of these three spheres: theory, empirical evidence and policy experience, focussing in particular upon the more recent literature. The balance of the introduction is taken up with a brief review of some basic concepts and patterns of internal migration. The remainder of the chapter is then divided into four. Section 2 is about the causes of migration – earnings opportunities and job search, information and financing, family strategies and the contextual setting, and displaced persons. Section 3 takes up the economic consequences of internal migration – the direct and indirect effects of rural emigration on rural production, the overall effects upon national product in the light of various market pathologies, and the much disputed consequences for income inequality. In the light of the foregoing sections, Section 4 turns to a review of the literature on policy experiences, and Section 5 offers a few closing thoughts.

¹ Many of the prior surveys have adopted fairly specific themes. For instance, Krugman and Bhagwati (1976), Yap (1977) and Schultz (1982a) examine the estimation of migration functions; Lucas (1976) considers theories of labor market pathologies in relation to migration, while Todaro (1976b, 1980) focusses upon the Todaro hypothesis; Todaro (1984) and Williamson (1988) are concerned with urbanization in LDCs; and various policy themes and stylized facts are reviewed in Simmons et al. (1977), Abumere (1981) and Oberai (1983).

1.2. Concepts and patterns of migration

It will be useful, at the outset, to establish some of the broad patterns which characterize internal migration within the developing countries. Our knowledge of these patterns is, however, restricted by the nature of the data available. This section therefore opens with a discussion of the data base and the limitations which this imposes upon analyses of these patterns. Rural-to-urban migration has dominated both policy concerns and economic analysis, and some stylized facts surrounding these movements are addressed in the following subsection. The remaining subsections take up rural-rural movements which dominate the volume of migration but have generated comparatively little interest, then temporary and circular migration on which the statistical base is exceedingly poor.

1.2.1. The data base

The movement of peoples may take many forms: moving house within an urban area, the wanderings of nomads, commuting to work, visiting relatives or friends, or relocating dwelling between regions. Our interest in any one form varies with the issues at stake: movements within a town may be of interest for urban planning but less so for an overall employment strategy.

Census and sample survey data normally report only a limited range of population movements. One limitation is the number of movements documented per person. Full life mobility histories are rarely gathered. More typically a census or survey may record place of birth as well as place of enumeration, though occasionally a place of prior "residence" is reported. Such limited mobility records can hide a good deal of movement in the presence of step and circular migration, both of which appear to be common in LDCs according to our restricted evidence.

A second source of limitation is in the degree of disaggregation when reporting "place" of current or prior residence. Frequently only a broad region is coded, perhaps together with some indication as to whether the residence is in a rural or urban zone. Naturally this precludes estimation of the extent of, for instance, rural-rural mobility within a region.

The picture is also complicated by difficulties in distinguishing birthplace, home, domicile and work place. With more frequent births under medical supervision in LDCs, birthplace and initial home are probably increasingly separated (Schultz, 1982a). The distinction between "home" – in the sense of a place to which one owes allegiance – and where one happens to be living is, perhaps, particularly sharp in some portions of the developing world. And transport improvements are permitting more extensive commuting, even in the developing countries, with a resultant separation of job location from residence, though largely ignored in dualistic models (Connell et al., 1976).

A part of the distinction between home and domicile is tied up with the intent to stay. In empirical work, most economists prove unwilling to trust self-reported intent to stay – an intent which may or may not be realized. There probably are behavioral differences between sojourners and settlers, for instance with respect to duration of optimal job search, forms and location of investments, and conjugal separation. But these differences prove difficult to investigate without reliance on reported intent. Yet documentation on actual return and onward migration is very partial (Nelson, 1976).

Some portions of the literature on migration in developing countries have come to focus more upon family strategies. In empirical work, this raises the difficult question of an appropriate definition of a family. Joint decisions involving immediate family members, and even unrelated persons not dwelling together, may not be uncommon. This may be particularly prevalent in those developing countries where the agricultural cycle normally involves rotation of family members between multiple dwellings (Lucas, 1985), and where kinship ties extend commitments well beyond the immediate family (see the discussion of shadow households in Caces et al. (1985)).

These various conceptual difficulties render interpretation of any observed migration patterns sensitive to the concepts used. What appear to be some of the emerging patterns?

1.2.2. *Urbanization*

Much of the policy interest in internal migration derives from concern, or even alarm, with respect to the rate of growth in urban populations and that of the larger cities in particular. Some data on the rates of urban transition and urban population growth are therefore reviewed first in this subsection, followed by evidence on the contribution of migration to urban population growth. The subsection closes with a few stylized facts on the selectivity of rural–urban migration with respect to age, gender and other personal characteristics – facts which will prove useful in subsequent sections but which are also relevant to considerations of the role of migration in promoting urbanization.

Rates of LDC urban population growth. International comparisons of urban population growth are hampered by the lack of a uniform minimum size for urban settlement definitions, and even by the practice in some contexts of defining a market town as rural, irrespective of size, if it happens to be in a predominantly rural region (see To-daro, 1984).

Based on each country's own definitions of urban areas Table 1 shows the intercen-sal rates of urban population growth and of urban transition for Africa, Asia² and for South America (including Central America and the Caribbean).

There is no clear trend in overall LDC urban growth in the second half of this century. South America does display a systematic trend toward slower urban population

² Japan is excluded from the urban population growth rates but not from the urban transition measures.

Table 1
Urban population growth and rate of urban transition

	Overall LDC	Africa	Asia	South America
<i>Urban annual population growth rate (%)</i>				
1950–1960	4.87	4.72	5.01	4.57
1960–1970	3.59	4.92	3.07	4.27
1970–1980	3.90	4.83	3.78	3.74
1980–1990	4.68	5.08	5.17	3.12
1990–2000	4.04	4.95	4.30	2.53
<i>% of population residing in urban areas</i>				
1950	17.0	14.5	16.4	41.5
1960	22.1	18.3	21.5	49.3
1970	24.7	22.9	22.9	57.3
1980	28.9	27.8	26.3	65.0
1990	37.1	33.9	34.4	71.5
2000	45.1	40.7	42.7	76.4

Source: United Nations (1991).

growth, but this is not true for Africa, and Asia shows no monotonic pattern. On the other hand, there has been a fairly steady rise in the proportion of population residing in urban areas, both overall in the developing countries and within each of the three continents reported in Table 1.

Williamson (1988) argues that this rate of urban transition is not unusual by European historical standards, though he also maintains that LDC city growth is exceptionally rapid in historical perspective.

Between 1875 and 1900, currently developed countries' urban share rose from 17.2 to 26.1 percent, about the same increase which took place in the Third World between 1950 and 1975, 16.7 to 28 percent...Between 1875 and 1900, city populations in the currently developed countries rose by about 100 percent; between 1950 and 1975, city populations in the Third World increased by 188 percent. (Williamson, 1988: pp. 428–429.)

The common concern with the speed of metropolitan growth in the developing countries must however be seen in perspective. The rate of population growth in the LDC cities (both overall and within each of our three continental regions) has actually been slower, for the most part, than has urban population growth. This is brought out in Table 2, in which the city population growth rates are derived from the populations of 173 urban agglomerations comprising one million or more inhabitants in 1990.

A similar reservation must also be expressed with respect to the pattern noted by Preston (1979: p. 201), "The general relationship between city size and city growth rates in developing regions is U-shaped". Preston (1979) reports, for 792 LDC cities,

Table 2
LDC city and urban intercensal growth rates

	Annual population growth %							
	Overall LDC		Africa		Asia		South America	
	Urban	City	Urban	City	Urban	City	Urban	City
1950-1960	4.87	4.49	4.72	4.57	5.01	4.23	4.57	5.15
1960-1970	3.59	3.99	4.92	4.90	3.07	3.70	4.27	4.41
1970-1980	3.90	3.40	4.83	4.19	3.78	3.22	3.74	3.53
1980-1990	4.68	3.36	5.08	4.18	5.17	3.30	3.12	3.17
1990-2000	4.04	3.26	4.95	4.34	4.30	3.41	2.53	2.39

Source: United Nations (1991).

population growth between the latest two censuses according to city size at the earlier census. Some of Preston's measures are summarized in the top panel of Table 3. The U-shape noted by Preston is apparent in the overall measures: the largest and the smaller cities grow most rapidly. However this U-shape appears to be a chance result of aggregating across quite different patterns within each of the four LDC regions reported in Table 3: only within East Asia is such a U-shape sustained. Moreover the smaller UN sample of 173 urban agglomerations shows the medium size cities with populations in 1980 between one and two million growing more rapidly than the largest cities since 1970, as may be seen from the lower panel of Table 3.

To sum up: urban population growth in the LDCs is high, though the transition to an urban population is not proceeding especially rapidly by historical standards. Although much of the policy concern focusses upon metropolitan growth, and on the

Table 3
LDC city population growth by city size

City size in 1000	Population growth rate %				
	Overall LDC	Africa	Latin America	East Asia	South Asia
4000+	3.89	2.66	4.55	3.58	2.95
2000-3999	3.20	-	-	1.73	4.66
1000-1999	3.08	2.61	3.73	2.32	3.55
500- 999	3.20	3.42	4.38	2.18	3.80
250- 499	3.81	4.45	3.90	3.67	3.40
100- 249	3.95	4.70	3.60	3.61	3.70
	Overall LDC				
	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
4000 +	4.59	4.02	3.31	3.07	2.84
2000-3999	4.68	3.92	3.30	3.21	3.26
1000-1999	4.22	4.02	3.59	3.81	3.75

Sources: Preston (1979) and United Nations (1991).

larger metropolises in particular, the LDC cities are not growing as rapidly as the broader urban areas, nor is it true that the largest cities are outgrowing the medium size cities, at least in proportional rates of growth.

The role of migration in LDC urban growth. How large is the contribution of rural–urban net migration to the high growth in LDC urban populations? Reported urban population growth may be decomposed into three contributing factors: natural population increase among indigenous urban inhabitants; the rate of migration into the urban sector; and the rate of reclassification of areas as urban zones. Todaro (1984: Table 4), reports a partial breakdown of intercensal, urban population growth with most of the evidence drawn from the 1960–1970 period. Only for 29 developing countries do census data permit any breakdown, and even then the role of migration and reclassification must be combined as a residual. The sample average contribution of migration plus reclassification amounts to 41.4% of total urban population growth in these 29 developing countries: natural, annual population growth amounts to 2.53%, while migration plus reclassification add a further 1.79%.³

Urban growth is currently exceptionally rapid in developing countries, but the explanation is not to be found in unusually rapid changes in the urban proportion produced by rural–urban migration but in the rapid changes in total population to which those proportions are applied... This point is readily overlooked in the midst of scholarly and political concern with internal migration. (Preston, 1979: p. 198.)

In view of the last remark, is the policy concern over rural–urban migration misplaced? The answer is surely no. The policy issues surrounding rural–urban migration transcend urban population growth alone. Such issues as the efficiency of labor use and consequences of migration for overall poverty are of paramount importance, even beyond any considerations of pressures on infrastructure stemming from rapid urban growth. Moreover, even if the principal concern remains that of urban population pressures, there are at least three reasons why migration rates are of critical importance: (i) although the estimated contribution of rural–urban migration to urban population growth may be smaller than that of natural urban population growth, the role of migration is still substantial; (ii) it could prove more cost-effective to tackle urban population expansion through policies directed at rural–urban migration than through attempts to promote family planning; (iii) the selectivity of rural–urban migration may result in an understatement of the ultimate contribution of migration to urban population growth as revealed by the simple decompositions into natural growth, migration and reclassification considered so far, for as the next subsection discusses, rural–urban migrants are predominantly in higher fertility age ranges.

³ In a similar breakdown for a sample of 20 developed countries, Todaro finds the absolute contribution of the residual migration plus reclassification is smaller, though this represents a much higher relative contribution to the slower urban expansion in these developed countries.

Selectivity in rural–urban migration. Rural-to-urban migration in developing countries, as in the developed regions, is dominated by young adults;⁴ higher levels of schooling completion are positively correlated with the probability of migrating to town, though the educated comprise a minority of migrants from most areas; and there are gender biases in urban immigration – with more male urban migrants in Africa and Asia, and more female migrants in Latin America, though obviously there are exceptions within these regions.⁵

Characterizing the selectivity of migration in this fashion may help in framing questions, but ultimately one wishes to know why migration is selective upon particular characteristics. The latter cannot be determined from a single equation, reduced-form analysis of regression upon personal characteristics alone. A structural, behavioral model is required. Indeed within such a framework, many personal characteristics – such as the extent of schooling and marital status – are endogenously determined together with the migration decision.

1.2.3. *The importance and neglect of rural–rural migration*

The extent of rural–rural migration is not well documented, particularly when this involves intra-regional movements. Where analysis proves possible, the rate of rural–rural migration typically proves far higher than of rural–urban migration (Connell et al., 1976).

For instance, Skeldon (1986) notes that just over 30% of India's population in the 1981 census report a previous place of residence different from their place of enumeration. Of those who moved in the ten years prior to this census, the composition of movements is:⁶

	%
Rural–rural	57.4
Rural–urban	19.5
Urban–urban	15.2
Urban–rural	7.9

If rural–rural migration is so much more common than rural–urban migration, why does the former remain relatively neglected in theoretical modelling, empirical analy-

⁴ Todaro (1984) notes that the high rates of natural population increase among urban dwellers are attributable in part to the age structure of the urban population, and to some extent this profile is kept younger through more frequent arrival of young migrants. In this sense, as Todaro notes, the contribution of rural–urban migration to urban population growth is understated by simply counting the numbers arriving.

⁵ For surveys of the “non-rigorous descriptive literature” (Todaro, 1976b: p. 65), establishing these patterns, see Brigg (1971), Herrick (1971), Byerlee (1974), Connell et al. (1976), Todaro (1976b), Simmons et al. (1977).

⁶ See also Lucas (1985) on Botswana and Lucas and Verry (1990) on Malaysia.

sis and in policy discussion? A part of the answer lies in the lack of data, though this, in itself, is also a reflection of lack of attention. Part of the answer derives from the visibility of urban population growth. In addition, the early dualistic development models envisioned a rather homogeneous rural sector, within which migration was seen to confer no real benefit. In point of fact intra-rural migration may have many properties in common with rural–urban migration: it can enhance income opportunities, may involve a transition from family to wage labor, may involve a shift from one line of production to another (between subsistence and cash crops, or simply between crop types), and may offer opportunities for family risk-spreading, no less than does rural–urban migration (Ahluwalia, 1978; Kikuchi and Hayami, 1983; Rosenzweig and Stark, 1989).

1.2.4. Notes on temporary and circular migration

Circular migration – returning to an initial residence – can normally only be detected in specialized surveys, since initial residence and place of enumeration do not differ. In consequence, the extent of circular migration, in the developing world or elsewhere, is not always appreciated.

Nelson (1976) examines some of the survey evidence available on circular and temporary migration (onward movement to another place) and detects some broad regional differences:

In most of Latin America the great bulk of migrants to the cities have left the countryside permanently. They may move on to different cities and they may return to their place of origin to visit relatives and friends, but few come back to rural areas to stay. In contrast, much rural-to-urban migration in Africa and parts of Asia is temporary. (Nelson, 1976: p. 721.)

One of the most detailed examinations is by Lee (1980) based on census data as well as a specialized survey in South Korea. The 1970 Census of Korea asked place of usual residence five years ago, as well as place of birth. Based on this, Lee finds that 9.1% of in-migrants during the 1965–1970 period are persons returning to their province of birth. Although this portion is not negligible, at least the Korean case hardly lends support to the idea that much rural-to-urban migration is temporary. Moreover, Lee finds that only 5.2% of inter-district migrants in Korea are persons returning to their province of birth and for inter-community migrants this fraction drops to 4.1%. Whether this declining fraction with level of disaggregation reflects differences in behavior among the different migrant groups or a constant rate of return to one's initial province, but not necessarily to one's initial community, is unclear.⁷

⁷ See Hugo (1982) on circular migration in Indonesia and Stichter (1985) on Africa. For data on rate of urban-to-rural migration, some of which is no doubt circular, see Skeldon (1986) on India, Lucas and Verry (1990) on Malaysia, and Pessino (1991) on Peru.

Later sections of this chapter take up some of the causes and consequences of temporary and return migration. However, even at this stage of depicting stylized facts, it is worth reproducing Nelson's account of a stylized life history, compiled from a number of case studies (notably in East Africa):

a young man who has completed his primary education moves to the city. There he stays with friends or relatives for a few years and earns cash for his own immediate needs and for future marriage payments, as well as to help pay younger siblings' school fees and contribute to general family funds ... when the migrant wants to marry he will return to his homeplace. If he has access to land or alternative ways to make a living he will stay for a time. Later, growing pressures for cash to build a house, buy or improve land or stock, and pay school fees and taxes may drive him back to the city, leaving his wife in charge of the home plot. ... After a few years the migrant may feel his interests at home need more constant attention. He may also have obligations to his aging parents.... One or more further cycles may follow. Eventually he will return to the country home permanently, either because he can afford to retire or because he has lost his job in the city. (Nelson, 1976: p. 723.)

It is clear from Nelson's account that cyclical movements can be quite complex, even though many individuals may fulfill only some stages of this stereotype pattern. Few statistical surveys are designed to disentangle full migration histories of return or step migration. As a result, statistical documentation of the patterns and selectivity in cyclical and step movements remains poor. Nonetheless portions of this chapter will address statistical evidence on at least some of the elements emerging from the case study material – on such issues as remittances to the rural home, the role of rural property and familial separation.

2. Factors affecting migration flows and selectivity

2.1. Income streams: the basics

Migrants obviously move for many reasons. The notion that migrants often move to gain access to a higher income stream has a very long history in the economics literature. Sjaastad (1962) formalized this idea by hypothesizing that whether an individual elects to move is influenced by the present value of the difference in income streams between alternative locations, minus any initial or subsequent, financial or psychic costs of moving. To the extent that costs are incurred at an early stage, migration is then a form of investment.

One common corollary, drawn from this human capital model of migration, is an explanation for the higher rate of migration amongst the young. Given a longer life horizon, the present value of any given stream of income differences is greater for the

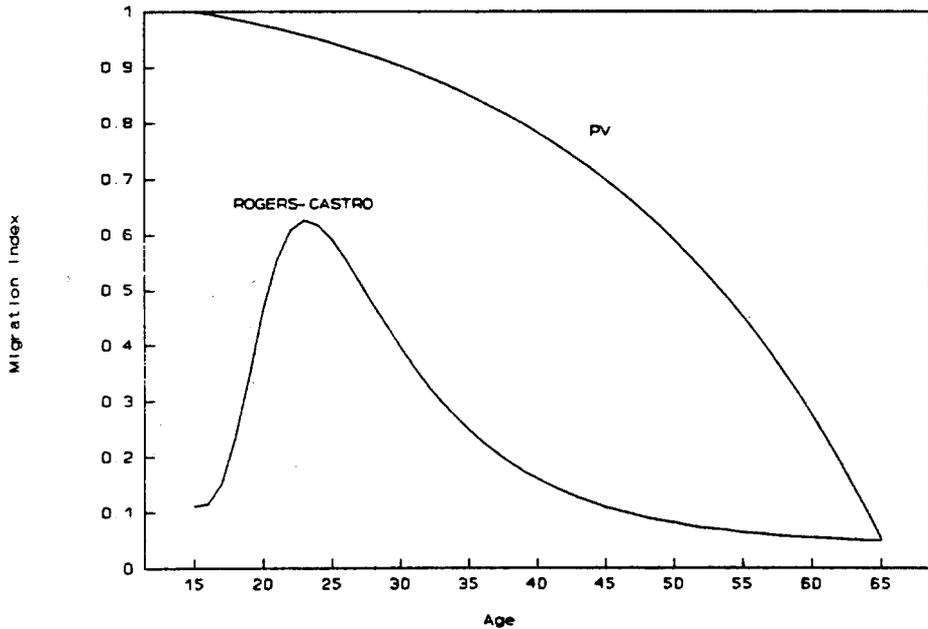


Fig. 1. Model of urban migration by age.

young, offering an enticement to move which diminishes with age. To the extent that the young have a higher discount rate than have older persons, this frequently made assertion may, of course, not hold.

Such a simple view does not do well in depicting a typical age profile of migrants (Schultz, 1982a). Fig. 1 shows the present value (PV) of the difference between an urban income which is a constant multiple of rural income, irrespective of age, assuming a constant discount rate and fixed retirement at age 65.⁸ The other curve in Fig. 1 is derived from the model of migration according to age fitted by Rogers and Castro (1984).⁹

The Rogers–Castro curve obviously picks out the peak of migration in early adult years, whereas the simple human capital model does not. In other words, the narrowing life span to retirement may help to explain the diminishing rate of migration with age, but other factors must enter the story to gain a more realistic picture as to why migration at first rises than falls away very quickly after the early twenties – a pattern common to both developed and developing countries.

⁸ See Schwartz (1976) for a discussion of the context in which employment opportunities are also affected by age.

⁹ This is the Rogers and Castro seven-parameter model, applied to mean parameter estimates for males in Japan, Sweden and the UK. For details on the nonlinear estimation methods used, see Rogers and Castro (1984: Appendix A).

2.2. Migration and job search

2.2.1. The Todaro hypothesis and theoretical extensions

In the first two decades following World War II, policy advice in the newly independent, developing countries, as well as conventional wisdom in the emerging field of development economics, followed earlier Soviet models, in focussing upon the transfer of labor from agriculture to industry as a concomitant of growth. That this transfer continued despite burgeoning shanty towns and even open, urban unemployment became both a pressing policy concern (in part because of the potential for political instability) and an intellectual puzzle.

Todaro (1969) offers a simple but powerful hypothesis. The essential idea is that urban jobs are more attractive than rural employment; entry to the better urban activities is somehow constrained; and search for urban job openings can be more effectively conducted in close geographical proximity. As a result, urban migration is induced as an investment in job search for the attractive, urban opportunities.¹⁰

Todaro's statement of the migration decision is actually a restatement of the model in Sjaastad (1962), in which Todaro replaces Sjaastad's known urban incomes by their expected values in computing present values, though Todaro continues to assume rural incomes are risk free.

Todaro also makes some strong, simplifying assumptions about the process of urban job search: formal sector wage jobs are the goal of rural–urban migrants; wages in the urban formal sector are exogenous and maintained above clearing by unspecified institutional forces; job search is conducted from a state of open, urban unemployment; workers are risk neutral and derive no utility from leisure. Together these permit expected utility from urban earnings to be expressed as proportional to the going urban wage multiplied by the probability of employment.

Blomqvist (1978) actually identifies two separate formulations of the Todaro hypothesis, distinguished by the determination of the latter element – the probability of employment. According to Blomqvist, Todaro's (1969) specification of the employment probability is determined in a short-run, dynamic setting, such that

$$p = (g + t) \frac{e}{u}, \quad (1)$$

where p is the probability of obtaining a job, g is the proportional rate of new job creation; t is the proportional rate of job turnover, e is the level of employment and u is the level of unemployment.

¹⁰ As usual, these ideas had their precedents. Indeed, in the *Wealth of Nations*, Smith (1812: p. 215) had rather a clear statement of the basic ideas; Frank (1968) addresses a number of these issues in an African context; and Wellisz (1968) develops a more general model.

In other words, Eq. (1) specifies the relevant employment probability as the number of job openings occurring within any period, relative to the number of persons unemployed. In contrast, Harris and Todaro (1970) assume that every urban job turns over in each period and no new jobs are created. In this essentially static case, the probability of employment is simply the fraction of the urban labor force in formal employment, since the chances of obtaining an urban job are equal for all urban workers (who are assumed homogeneous), irrespective of prior employment status:

$$p = \frac{e}{(e + u)}. \quad (2)$$

Few theories in economics have been the subject of such widespread acceptance in policy circles, of empirical challenges, and of theoretical extensions. Each of these will be dealt with in various sections of this chapter, but the present section focusses upon the job search process, at first reviewing theoretical extensions then turning to empirical evidence.

The Harris–Todaro simplifying assumption of a random job lottery with replacement in each period is patently unrealistic. Fortunately, the assumption of this specific form of job turnover can be relaxed to some extent without significantly altering the model. Specifically, Stiglitz (1974) shows that exactly the same expression for the expected urban wage is derived from two alternative approaches, when job openings are created only through exogenous turnover: (a) a random selection from the urban pool of unemployed, resulting in a Poisson distribution of duration of unemployment; and (b) a queue for jobs organized in order of arrival in the urban sector.

Harris and Sabot (1982) expound a theoretical framework which relaxes two other assumptions in the Harris–Todaro stylized job search process – the assumptions of a single urban wage and of perfect information about job opportunities (see also Stark, 1982). Harris and Sabot depict workers confronted by a continuous probability distribution of alternative urban wages, though what sustains this exogenous distribution is explicitly omitted from consideration. At first the actual distribution is unknown and decisions are based upon a subjective distribution. Sampling of job offers, which is assumed to take time, enhances information, and subjective estimates of the available opportunities converge towards the objective distribution. Perhaps the main contribution of this framework is that an increase in the variance of urban wages extends the average duration of optimal job search and hence exacerbates unemployment. The decision to migrate is thus enhanced not only by a greater expected urban wage but also by a lower spread in urban wages.

The appearance of higher moments in the distribution of incomes as an additional explanatory term is a feature to which later sections of this chapter return – in considering risk aversion, the role of relative deprivation as a determinant of migration decisions, and the consequences of aggregating individual decisions. Indeed the manifold potential roles for the variance and other moments of the income distribution in influ-

encing migration flows raises an issue, which has not been adequately addressed in empirical testing, of discerning among these alternative explanations.

In the Harris–Todaro model an equilibrium, with no incentive to further rural–urban migration, occurs when the rural wage equals the expected urban wage. Comparisons of rural and urban pay are thwart with many difficulties – including skill differentials, adjustments for cost of living, property components in income of the self-employed, and complexities in contractual terms both in urban and rural areas (Squire, 1981; Kannappan, 1985). Nonetheless it seems the earnings gap is large: Gregory (1975) estimates that nominal manufacturing wages average 37% higher than agricultural wages for unskilled laborers in a sample of 23 LDCs (see Squire, 1981: Table 30). If this estimate is approximately correct then equilibrium in the Harris–Todaro model would require an unemployment rate of some 27%. Yet open unemployment rates in LDCs very rarely attain such extreme levels, even in the urban sector (see Todaro, 1984: Table 5); the poor cannot finance a protracted job search while jobless. Two responses are possible to such rough calculations: one is that a zero migration rate does not prevail and therefore a wage–unemployment equilibrium should not be anticipated; alternatively a number of commentators have suggested that some reformulation of the Todaro model is warranted.

Todaro's model was in part a response to observations on migration into Nairobi. That same city prompted a path-breaking ILO employment mission focussing considerable attention on the operations of the informal labor market (ILO, 1972). Fields (1975) combines these two, remodelling Todaro's formal sector job search, financed in part by participation in the informal sector (see also Stiglitz, 1974). In addition, Fields hypothesizes that even rural residents who conduct an urban job search from their rural base have some chance of finding an urban formal sector job, though their chances of success are lower than for persons who move into town to search (which is quite consistent with the spirit of Todaro's original model). Another realistic alternative is to allow for risk aversion on behalf of migrants.

Suppose, for instance that the objective of a family is to assign some portion of family members (ϕ) such as to maximize

$$p\omega(\phi[w_1 - c] + [1 - \phi]w_r) + [1 - p]\omega(\phi[w_2 - c] + [1 - \phi]w_r), \quad (3)$$

where p is the probability of obtaining a formal sector urban job, ω is the family's utility function, w_1 is the urban formal sector wage, w_2 is the urban informal sector wage, w_r is the rural wage and c is the cost of migrating.

If the utility function takes a simple logarithmic form, then using the first-order condition with respect to ϕ it can be shown that $\phi > 0$ if and only if

$$pw_1 + [1 - p]w_2 - c > w_r. \quad (4)$$

It follows that when $w_2 = c = 0$, equilibrium with positive assignment of some family members to town in this case of risk aversion requires $pw_1 > w_r$.

Each of these modifications allows more realistic calculations of equilibrium unemployment rates in the extended Todaro framework. These extensions also raise important empirical questions about the nature of the urban informal sector and its role in the job search process – questions to which the next section turns.

2.2.2. Evidence on job search and the informal sector

At least four aspects of initial job placement and job mobility amongst rural–urban migrants have been subjected to empirical examination: the duration of initial unemployment among migrants; the frequency with which migrants find an urban job prior to actual relocation; the extent of subsequent mobility from the informal into the formal sector; and the income gap between the urban formal and informal labor markets.

Duration of initial unemployment. If a scenario is envisioned in which the only period of unemployment is an initial one after arrival in town, then the fraction of time a migrant will be employed is equal to one minus the duration of initial search relative to time until withdrawal from the labor force. Ignoring discounting and assuming a constant urban wage, the expected wage in town is then the prevailing wage multiplied by one minus the duration of initial unemployment relative to remaining work life (Stiglitz, 1974). However, the initial duration of unemployment suffered by migrants is of general interest even beyond this particularly simple formulation. Are migrants in fact unemployed for long periods upon arrival? Do migrants suffer more extensive periods of unemployment than urban residents who lose their jobs?

In the context of Botswana, Lucas (1985) estimates logistic functions for the probability of being in employment (either wage or self-employment) in town. This probability does rise with duration in town, a rise which tapers off. However, the magnitude of this rise is both small and statistically insignificant (perhaps in part because the data measure time elapsed in town in years, thus not permitting a distinction within the first year). Moreover one cannot discern from such estimates whether any tendency for employment to rise is a cohort effect or the consequence of reverse migration by those failing to obtain a job.

In a sample of 1406 male migrants into Delhi (both from rural and other urban locations), Banerjee (1991) finds the average completed spell of unemployment is only 17 days. The distribution of these spells is (Banerjee, 1991: Table 1):

Duration of initial unemployment	%
Prearranged job	17.3
Less than 2 days	28.9
3–7 days	17.4
8–15 days	13.7
16–30 days	10.5
30–90 days	8.4
More than 90 days	3.8

Thus, more than 80% of migrants experience some initial open unemployment, but by the end of the first month only 12% have not found a job. Again, Banerjee notes that these estimates may be biased downwards to the extent that unsuccessful job seekers have returned from Delhi and hence are omitted from the sample. Moreover, India has enjoyed quite low rates of open unemployment (see Fallon, 1983). Studies for a few other LDCs, summarized in Yap (1977: Table 3), also suggest that more than three-quarters of migrants who stay in town have found work within 3–6 months.

Frequency of urban jobs arranged prior to migration. In a series of studies, based on his Delhi sample, Banerjee (1983, 1984b, 1991) examines whether or not migrants report having identified their initial urban job prior to arrival in town.

Of those who entered the informal wage sector, 12 per cent had prearranged their urban jobs (in the sense that they had received firm commitment of employment from the employer), and 42 per cent had migrated on the suggestions of urban-based contacts ... [N]early three-quarters of the non-wage sector entrants expected to set up such activities on arrival in the city ... [A] majority of formal sector entrants too had ... lined up their jobs from the rural area. (Banerjee, 1983: pp. 411, 419.)

It is difficult to reconcile this with the evidence on initial unemployment, summarized in the previous paragraph, derived from the same survey. Two possibilities for reconciliation are that migrants arrive before their prearranged urban jobs are ready or that a substantial fraction of purported prearranged jobs fail to materialize.

Banerjee (1991) reports probit estimates of migrating with or without a prearranged job, based upon these data. According to these estimates, the probability of finding an urban job before relocation rises with the level of education, with age, and with desire for a non-manual job. In other words, a strategy of migrating to seek an urban job – the Todaro scenario – is more common among young, uneducated, manual workers. Interestingly, Banerjee also finds the chance of identifying an urban job prior to moving is lower if the migrant owns any rural land. This Banerjee suggests may reflect dominance in the ability of land owners to finance an initial job search over any difficulties of being an absentee land owner. Alternatively, land may provide a valuable source of insurance, rendering risk averse potential migrants more willing to undertake a risky move to town if they possess land.

Informal–formal sector mobility. Fields' (1975) extension of the Todaro hypothesis suggests that initial urban informal sector employment is used to finance search for formal sector entry. Is such mobility observed in practice?

Cole and Sanders (1985) note that most migrants into Mexico City have little education and consequently the authors assume these migrants must be unable to transfer to the formal sector. They consequently argue that any observed positive correlation

between modern urban sector growth and more rapid rural-to-urban migration is the consequence of an indirect effect: formal sector growth stimulates demand for the services and goods produced in the informal sector, and expansion in the latter stimulates migration. However this hardly constitutes a direct test. Moreover, Santiago and Thorbecke (1988), in reviewing time-series data on sectoral pay and employment in Puerto Rico, report a decline in informal sector pay and employment associated with expansion in the formal sector¹¹ (see also Stark, 1982).

Banerjee (1984b) reports that in his survey of male migrants in Delhi, "Only 24 per cent of those who entered the informal sector on arrival and 6 per cent of the non-wage workers had found their way into the formal sector by the time of the survey" (p. 414). On the other hand, this rate is slightly higher for those who had been in Delhi longer – just over 29% of those who entered the informal sector on arrival are in the formal sector after five years, whereas this averages only 10% for those arriving in the last two years. The chances of transfer from the informal to the formal sector are thus not negligible in this context, and are somewhat greater among men who have been in town longer, though yet again the latter may reflect selective, return migration by those failing to transfer.

Informal–formal sector pay comparisons. Fields' extension of the Todaro hypothesis assumes that pay is greater in the formal sector, thus prompting search for these more attractive alternatives even while employed in the informal sector. Two studies of Bangkok (Chiswick, 1977; Teilhet-Waldorf and Waldorf, 1983) and two of Kuala Lumpur (Mazumdur, 1981; Blau, 1986) present seemingly contradictory evidence, asserting that pay is greater in the informal sector, at least for the unskilled. However at least three difficulties plague any such comparisons. The first is the definition of income from self-employment in the informal sector: as Blau (1986) notes, capital employed in such activities generally remains unknown, and even whether income refers to gross output or to value added is not always clear. A second difficulty stems from potential selection bias: for instance Blau (1985) concludes that in urban areas of Malaysia, ignoring self-selection as between wage and self-employment overstates relative earnings in the latter. The third difficulty raises a much more general and murky issue, namely the definition of the informal sector. Thus, both Blau (1986) and Teilhet-Waldorf and Waldorf (1983) assume that self-employment and the informal sector are synonymous, even though the self-employed typically include many professionals.

Summing up: Is the Todaro hypothesis refuted? Several of the contributions under the four prior headings depict their results as refutations of the Todaro hypothesis. Is this appropriate?

¹¹ On the other hand, Portes and Benton (1984) emphasize some of the data limitations in measuring informal sector growth, and argue that the relative magnitude of formal sector employment growth is normally exaggerated.

The evidence is really too limited to draw any strong conclusions. Such as it is, it seems the average duration of initial unemployment may not be very long, that a substantial portion of migrants have identified their job prior to moving, and by no means all informal sector entrants subsequently transfer to the formal sector. This scenario does not fit well with the Todaro or Harris–Todaro models.¹²

These models are intentionally stated in stylized, exaggerated form. Much of what matters in these hypotheses survives this subsequent evidence: even in low-unemployment India, more than 80% of Delhi's male migrants experience some initial open unemployment, and 24% of those entering the informal sector transfer to the formal sector. This evidence is thus quite consistent with a substantial portion of urban migrants relocating to enhance their chances of finding a better urban job, though this may be a more common strategy among the young and unskilled. Nor need a "better urban job" be confined to the formal wage sector; more lucrative opportunities in the urban self-employment sector may also be more readily sought after arrival in town. Indeed, the Todaro hypothesis may even be inverted, suggesting an investment in menial, urban wage jobs as a path to subsequent transfer to the urban self-employment sector (see Blau, 1986: Table 3). What ultimately matters in the Todaro idea (and its subsequent extension in the Harris–Todaro model) is that entry into low (or no) pay activities may be a worthwhile investment in local search for better opportunities – and this is not convincingly contradicted by the evidence.

2.3. Estimating responsiveness to labor market opportunities

The direct evidence with respect to job search and transition by migrants is suggestive but inconclusive in regard to the Todaro hypothesis. Other forms of evidence on the effect of labor market opportunities on the decision to migrate are abundant. The purpose of the present section is to sketch some of these under three headings: (a) One branch of the literature addresses aggregate evidence on industrial job creation and urban population growth, and this is taken up first. (b) Some of the difficulties in specifying and estimating migration decision equations, incorporating earnings differentials, as well as a synopsis of the results, are given under the second heading. (c) Lastly the subset of migration equation estimates which incorporate employment probabilities as well as earnings is summarized.

2.3.1. Industrial employment and urban population growth

Hoselitz (1953) notes an empirical regularity in the small ratio of industrial employment to urban population in developing countries, relative to ratios observed historically in the now developed economies. "Hoselitz's thesis has encouraged the view

¹² See Fields (1989) for extensions of the Harris–Todaro model incorporating some of these stylized facts.

...[of] urbanization without industrialization ... the problem took on alarmist dimensions ... [and] fresh new tests of the Hoselitz hypothesis have gained high research priority" (Williamson, 1988: p. 440).

Much of this evidence is cast in growth form. Preston (1979) detects no decline in the ratio of industrial employment to urban population in the LDCs as a whole from 1950 to 1970. However, using World Bank data from the 1960s, Berry and Sabot (1984) show that, in historical perspective, LDC urban population growth is indeed rapid despite small rates of industrial employment growth. Becker et al. (1986) argue that not only has India's manufacturing employment growth (in the factory sector) been slower than urban population growth, but when "organized" urban employment growth slowed during the 1970s, urban population growth accelerated. Becker and Morrison (1988) find that urban population growth in sub-Saharan Africa exceeds the growth in manufacturing employment. Moreover, in regression estimates of urban population growth in that region, Becker and Morrison report a positive but quite small (instrumented) effect of urban modern sector employment.

Whether one should be alarmist about such findings is far from obvious. The shadow cost of marginal industrial jobs cannot be deduced from this evidence. Certainly the mere observation that much of the urban population, and even a growing fraction, is not employed in the formal industrial sector need not imply a zero marginal product. Any tendency to translate the Hoselitz thesis, or a growth variant of this thesis, into a statement about over-urbanization is misplaced.

Whether rapid urban growth accompanies slower industrial growth because of an induced supply of labor or, for instance, as a result of intersectoral demand is not identified in a single equation model. One method adopted to disentangle some of these links is simulation with spatial computable general equilibrium (CGE) models. Such models can be useful in quantifying the contribution of alternative policies and exogenous trends in promoting city growth (Collier, 1979; Becker et al., 1986). But this genre of models is ultimately driven by their construction: they are not appropriate grounds for classical statistical tests.

2.3.2. *Estimating responsiveness to earnings differentials*

A key component in constructing spatial CGE models is the elasticity of labor supply to geographic earnings differentials. The literature reporting estimates of this responsiveness is vast and no attempt is made here to review all of these contributions. Rather, the focus here falls upon some of the econometric problems associated with specifying and estimating this responsiveness.

For simplicity, suppose that the probability μ of person a , observed at random, choosing location i , is

$$\mu_i^a = \mu(W^a, C^a, A^a, \varepsilon^a), \quad (5)$$

where W^a is a vector of discounted wage streams available to a in various locations, C^a is a similar vector of discounted costs incurred in relocating, A^a is some vector of a 's personal attributes, and ε^a is a stochastic term reflecting a 's idiosyncratic tastes. Two principal routes are adopted to estimation of such equations – distinguished by whether aggregate or micro data are used.

A stylized representation of a macro migration equation estimate might be written

$$m_{ji} = m(w_i, w_j, d_{ji}, A_j, \xi), \quad (6)$$

where m_{ji} is the fraction of j 's population migrating to i , w_i and w_j are the mean wages in i and j respectively, d_{ji} is the distance from j to i , A_j is a vector of average personal attributes among j 's population, and ξ is a stochastic disturbance.

Two aspects of Eq. (6) as an approximation to Eq. (5) are worth emphasizing. One is the use of proxy variables. In particular, the typical macro migration equation includes only current earnings as a proxy for the discounted stream of future earnings at the time of migrating. Also distance is normally seen as a proxy for transition costs, assumed to vary directly with transportation costs, psychological costs of removal to an unfamiliar milieu, and costs of information acquisition.

The second aspect is that Eq. (6) includes only mean values for earnings and personal characteristics. If both Eqs. (5) and (6) are strictly linear, Eq. (6) can then simply be viewed as derived from the expected value of Eq. (5). If Eq. (6) is nonlinear, however, as when estimating a logit form to avoid dependent variable truncation for instance, this simple transition is incomplete. In particular, if Eq. (5) is nonlinear then taking expected values would introduce higher moments of the explanatory variables, and omission of these terms may result in omitted variable bias (see Lucas, 1975).

A substantial number of macro migration equations, similar to Eq. (6) have been estimated for developing countries. Most are cross-sectional, using different regions of origin and destination as observations.¹³ Some, but not all, instrument the earnings terms to correct for simultaneity bias. As Yap (1977) notes in reviewing the earlier contributions in this sphere, most estimates find a positive effect for destination wage, a negative effect for origin wage, and a negative effect for distance.

With the advent of specialized sample surveys, micro estimates of migration decision equations similar to Eq. (5) have proliferated in more recent years. In these, the dependent variable is usually a dummy variable, for the mover–stayer distinction, or polytomous if more than one destination is distinguished. The principal difficulty which such estimates present is in the measurement of earnings at the alternative locations. For stayers, the wage they would receive elsewhere is not directly observed; for migrants, earnings prior to migration are not usually reported, nor is potential pay in

¹³ For early examples see, for instance, Beals et al. (1967), Sahota (1968), Greenwood (1971), Levy and Wadycki (1974).

rejected locations directly observed.¹⁴ Macro estimates effectively bypass this difficulty by assuming that each person's pay in any given location is the mean pay actually observed there. A number of micro studies attempt to improve on this by estimating an earnings equation in alternative locations, thus at least projecting average pay according to a subset of personal characteristics. In itself, this approach raises three additional problems. (i) Some identifying restrictions are necessary to distinguish the set of personal characteristics entering the earnings prediction equation from those conditioning taste or otherwise entering the migration decision equation. (ii) Unbiased estimation of the earnings equations requires correction for sample selection, since not everyone earns. Typically this is achieved through a subsidiary probit estimate of the chances of earning, from which a hazard rate is computed and included in the earnings equation. This again requires some identifying restrictions on the set of personal characteristics included in the probit equation for earners. (iii) Finally there is a potential problem of positive or negative selection in migration; movers may differ systematically from stayers in ways not reflected in measured characteristics alone. They may, for instance, be more enterprising, more willing to take risks, or brighter. Conversely, migrants may differ from the indigenous population at destination in unmeasured ways.

There has been a fairly steady rise in the degree of sophistication in dealing with these issues. Perhaps one of the most comprehensive is Falaris (1987).¹⁵ Falaris estimates a nested logit model, with choice of state nested within regional choice in Venezuela. The estimation procedure allows for selection correction for choice of state (and region) in estimating earnings equations for each state, as well as for correlation between the errors in the earnings equation and in the stochastic utility function for any given individual. Falaris finds significant positive selection in six out of the 17 state earnings equations estimated, implying that in these six cases the people who chose to go to (including remaining in) these six states receive higher wages than would observationally equivalent people drawn at random from the population. Unobserved similarities are also found between states within the regional groupings adopted, indicating a gain in efficiency in specifying a nested logit model. However, "the main results of the structural estimates are that wages and distance are important determinants of migration (with positive and negative coefficients, respectively, as expected). If a state is the individual's origin, this increases the relative probability of choosing it over another state" (Falaris, 1987: pp. 440–441).

Despite the refinements, the chief messages from the results have thus not altered our understanding, even in comparison to macro estimates. Whether further effort in refining our estimation techniques will pay off in terms of removing biases and in-

¹⁴ If information on migrants is in the form of absentees, then even current pay may be unknown. Some studies bypass the difficulty by looking at push factors alone, but this may well lead to specification bias (see, for instance, Nabi, 1984).

¹⁵ See also Hay (1980) on Tunisia, Tunali (1985) on Turkey, Vijverberg (1989) on Cote d'Ivoire, and Pessino (1991) on Peru.

creasing precision is obviously unknown. A systematic comparison of the improvements to date, from any given data set, may be worthwhile. On the other hand, perhaps the balance of effort should shift toward formulating and testing newer hypotheses.

2.3.3. *Estimates incorporating unemployment*

Surprisingly few estimates of migration decision functions incorporate measures of unemployment. Again, those that do may be divided according to their use of macro and micro data.

Falaris (1979) finds that employment rate measures at origin and destination have no significant effect on migration in a two-stage least squares model of inter-regional migration in Peru.¹⁶ However, from three-stage least squares estimates of inter-regional migration in Mexico, Greenwood (1978) reports that rising employment levels (given earnings) both deter out-migration and accelerate in-migration, though reductions in the level of unemployment accentuate only the latter effect.¹⁷ Schultz (1982b) finds, for Venezuelan males with less than secondary schooling, that migration is affected by the wage gap but not by employment probabilities. However, for males with more education, Schultz finds that the elasticity of migration with respect to employment is greater than with respect to wages. Moreover, at least three studies based on inter-regional aggregate migration data estimate that higher unemployment rates at destination deter migration, given earnings differentials.¹⁸ In Tanzania, Barnum and Sabot (1977) estimate a positive role for urban job probability, whether constrained to interact with urban wage to form the expected wage or not. Salvatore (1980) finds the difference between unemployment rates at origin and destination affects south to north migration within Italy.¹⁹ Banerjee and Kanbur (1981), formulate the urban risk variable as the open unemployment rate relative to the employment rate and detect a negative effect upon urban migration in the 1961 census of India.

Lucas (1985) applies micro data to estimate a multinomial logit model of migration decisions in Botswana, incorporating both earnings and employment at origin and destination. As with the micro data studies incorporating earnings alone, prediction equations are estimated for earnings and for employment probabilities in the alternative locations. Earnings and employment probabilities at origin and in town are included separately, without constraining them to be symmetric or to enter in the form of expected earnings. Four separate migration equations are estimated, for four regions of origin. Tests on the estimated parameters fail to reject a hypothesis of symmetry – higher home earnings and employment probabilities have an equal and opposite

¹⁶ See also Fields (1982).

¹⁷ See also Greenwood et al. (1981).

¹⁸ In addition, Cole and Sanders (1983) proxy unemployment by labor force participation measures in Mexico, which offers a fairly indirect test of the Todaro hypothesis, though they interpret their results as consistent with the Todaro hypothesis.

¹⁹ See also Salvatore (1981).

effect upon migration in comparison to urban earnings and employment probabilities. Moreover, the implied number of additional adult migrants resulting from creation of one extra urban job exceeds one. Whether the additional migrants are simply adult family members accompanying the migrant with no intent to enter the urban labor force cannot be distinguished.²⁰ In addition, these results emphasize the problem of rural income risk, to which later sections of this chapter return.

2.4. Networks and information

A substantial amount of evidence indicates an empirical regularity: persons having access to kinship and other networks at a place of destination are more likely to choose that place.

Destination contacts have a positive effect on migration to a specific area, when contacts are measured by the presence of parents in the city, ... by potential ethnic contacts, ... by language similarity between areas .. or by the stock of persons in the destination who had migrated earlier from the home area. (Yap, 1977: pp. 248–249.)²¹

However, several interpretations of these regularities are possible. For instance, having personal contacts may diminish the psychic costs of relocating, may lower the financial costs of resettling (by the common practice of initial accommodation with friends or relatives), or may speed the process of job search (Yap, 1977). More generally, networks may enhance information available to potential migrants and reduce the risk associated with the urban prospect (see, for instance, Goodman, 1981; Taylor, 1986).

The lack of complete information certainly raises an interesting issue, for Sjaastad's human capital model is couched in terms of known and certain alternatives, while the Harris–Todaro model introduces uncertainty but retains complete information about wages and the chances of employment. Does adding more complete information about earnings opportunities and the risks of unemployment enhance or deter migration? It is not clear. The answer depends very much upon whether uninformed perceptions are biased upwards and skewed towards smaller subjective risks (see Harris and Sabot, 1982).

Not surprisingly, given this ambiguity and the difficulty in disentangling the role of information from other factors, the evidence in this sphere is difficult to interpret. An observation that the educated tend to be less deterred by distance in migrating (Levy

²⁰ Ultimately labor force participation is difficult to measure in any context, but perhaps especially so in low-income countries where family enterprises are common.

²¹ Yap also cites the sources of evidence in support of these statements. See also Ritchey (1976).

and Wadycki, 1974) has been interpreted as a reflection of easier access to distant information for the literate (Schwartz, 1973). There are other reasons why the educated may be less deterred by distance, including access to capital to finance such moves (to be taken up in the following section), and perhaps the lack of nearby jobs for the educated – the greater the degree of specialization, the larger the market necessary to secure a match (Yap, 1977).

Caces et al. (1985) report a multinomial logit analysis of intent to move to Manila, to Hawaii or to stay at home, for a sample of adults in the Ilocos Norte province of the Philippines. Included in the explanatory variables are dummies for the existence of friends or relatives in the two destinations. The estimates show a positive effect of relatives in either Manila or Hawaii in attracting more migrants to the respective destination.²² The cross effect – contacts in Manila affecting migration to Hawaii or vice versa – the authors dub a “competing auspices” effect. This effect proves negative (although statistically insignificant) in both cases, the cross effects not being constrained to be equal. However, as Caces et al. note, the cause of these effects is unclear if only because the presence of family in Hawaii renders access to a US visa considerably easier. Taylor (1986), similarly estimates a multinomial logit model for internal migration, international migration or remaining in the home village for a sample of 423 adults from two villages in Mexico. Taylor finds that having kin (son, daughter, sibling, or parent of household head) at destination increases the chances of international migration but not of internal migration. Taylor interprets this as a reflection of the higher risk inherent in international migration and the importance of kinship networks in reducing the effective risk, though presumably an alternative interpretation may again stem from ability to enter the US legally.

Banerjee (1984b) reports that 27% of his sample of male migrants in Delhi indicate having no prior information about employment opportunities before moving although 85% had relatives or friends there. This is one of the few studies that attempts to incorporate direct data on job information, and the result suggests that having a contact in town is no guarantee of possessing specific information, although of course more general information about the job market could still have been transmitted.

One of the most interesting recent models incorporating information generation and migration is that of Pessino (1991). The idea is that distant information is less readily available and all information can take time to acquire. Initial moves from villages are thus often to nearby towns, about which information is available. In the town the migrant learns of other opportunities more distant from his or her initial home, resulting in the frequently observed step migration. Once again these ideas prove difficult to distinguish empirically, and the connection with the interesting evidence from Peru presented by Pessino is not transparent.

If differential information were available among potential migrants – perhaps enhanced by contacts at destination, perhaps affected by distance – what would be the

²² For related evidence on Mexican emigration, see Taylor (1986).

policy implication? Yap (1977: p. 250) suggests that "... redirection from larger to smaller cities may be feasible if wage incentives are supplemented by advance information and assistance in moving". Fuller et al. (1985) report on an experiment, offering more information about opportunities in towns, other than Bangkok, to residents of a set of villages in Thailand. From the villages where additional information was provided, migration to the smaller towns increased, whereas no such increase occurred from other, control villages. On the other hand, no reduction in the rate of migration to Bangkok from the better informed villages was observed. In other words, total migration was increased, not diverted from the capital to smaller towns, as a result of the additional information.

The foregoing literature on networks and information addresses information available to migrants about jobs. However this is only one side of the story. Modern labor economics also focusses upon the asymmetry in information about skills or productivity – information possessed by workers about themselves but not readily seen by a potential employer. In a series of theoretical contributions, Katz and Stark address these issues within the context of migration, showing that both extent and selectivity in migration may be affected (Katz and Stark, 1986b, 1987, 1989; Stark, 1991a). In particular, these models assume that the skill of each worker is known at the place of origin but not at destination. Risk neutral employers at the place of potential destination attribute to each migrant, irrespective of individual skill, the average skill of all those who actually migrate.²³ If wage offers at destination then reflect this estimated skill, the consequence of asymmetric information is to lower destination wage offers by most for the most highly skilled. The consequences for the extent and selectivity of migration depend upon the resulting shape of the skill–wage profile at destination and origin. If these profiles are nonlinear, then multiple equilibria may exist and generalizations become difficult (Katz and Stark, 1987). On the other hand, if the skill–wage profiles are linear in both locations, and if low-skill workers would migrate under symmetric information, then adding asymmetric information rotates the destination wage profile downwards at higher skill levels – more skilled migrants are attributed with only the average skill of their migrating compatriots who include the least skilled.²⁴ Adding asymmetry then clearly lowers the average skill level of migrants and reduces the volume of migration. Katz and Stark also explore the effects of eventual discovery by destination employers of migrants' true skills and of pre-migration signalling by migrants. Somewhat surprisingly, the addition of eventual discovery may benefit low skilled workers:

... one would have thought that eventual discovery will lower the benefits to those who have most to hide, namely the workers with low skill levels. However, this does not happen in our case since the workers with higher skill levels attracted by

²³ For an extension to risk averse employers, see Katz and Stark (1987).

²⁴ Sufficient conditions for linearity are spelled out in Stark (1991a).

eventual discovery provide a benefit to low-skill workers by raising the pre-discovery wages (Katz and Stark, 1987: p. 724.)

Stark (1991a) considers a signalling model where the costs of signalling true skill are fixed. If this cost is too high to warrant signalling by low-skill workers but sufficiently low to encourage signalling by high-skill workers then a U-shape pattern emerges. Low-skill workers migrate without signalling, no migration occurs among those with intermediate skills, and migration plus signalling is undertaken by the highly skilled.²⁵ This pattern essentially corresponds to the rural–urban selectivity, noted by Connell et al. (1976), drawing disproportionately upon primary and secondary school graduates with a (weak) dip among middle school leavers in between. However, as with much of the labor market literature on asymmetric information, these theories await more rigorous testing.

2.5. *The role of capital*

So far, in this chapter, the focus in discussing the determinants of migration has fallen largely upon the earnings of labor. This section now takes up two aspects related to capital: the financing of migration and the issue of tied rents received from capital.

2.5.1. *Financing migration*

Although largely neglected in the estimation of migration equations, the human capital framework emphasizes the discounted stream of incomes in alternative locations and hence the fact that migration is a form of investment. The supply curve of loanable funds shifts from family to family (see Becker's Woytinsky Lecture reproduced in Becker, 1975). This need not be a reflection of imperfect capital markets, but simply of variations in collateral possessed, or in the opportunity cost of marginal use of funds. Yet it seems likely that imperfections in capital markets compound these differences in low-income countries where financial markets are less complete.

Whatever the cause, differences in the supply of loanable funds enable varying degrees of investment in the more expensive forms of migration. From their survey of village studies, Connell et al. (1976) detect a U-shape pattern in out-migration from LDC villages with higher propensities to move among the rich and poor. In the context of India they note:

Sons, and to a lesser extent daughters, of successful farmers move to ... urban employment; sons, or often families, of labourers move temporarily, as often to the village as to the city (Connell et al., 1976: p. 24.)

²⁵ This result can also be extended to the case where signalling costs diminish with skill levels.

The possibility of a quadratic relation between income and propensity to migrate is taken up in two multivariate analyses, with conflicting results. Despite the suggestion by Connell et al. of a dip in migration rates among middle income groups in India, Banerjee and Kanbur (1981) find that migration by men from rural areas of one state to urban areas of another state of India, prior to the 1961 Census, initially rises with rural income then turns down at higher incomes. In contrast, Stark and Taylor (1991), in their multinomial logit analysis of migration among 423 adults from the Patzcuaro region of Mexico in 1983, find no statistically significant pattern with respect to the influence of family income on the propensity for internal migration. This last result could partly reflect including education as an explanatory variable: the wealthy are better educated, and there is evidence that educated migrants more readily take on more expensive moves to town (Levy and Wadycki, 1974). Any effects of access to cheaper funds on the propensity to migrate thus remain to be disentangled in the empirical literature. Simple correlates of the type noted in Connell et al. are clearly insufficient: any pattern detected might then reflect differential gains in earnings according to education level, more and better use of information, contacts in town among the educated/wealthy and hence cheaper settling in costs, variations in the degree of subjective risk aversion across wealth classes, or indeed differences in the supply of funds for education and hence migration.

2.5.2. *Tied rents*

These complexities are compounded by the role of personal and family assets in influencing the migration decision, for the composition of these assets and the distribution of ownership rights, and not just the level of assets may matter.

Early views of the peasant household within development economics focussed upon the tendency to share in output from the family plot. It was assumed that selfish individuals would therefore compare their income at home, the average product under equal sharing, with an outside wage in deciding whether to migrate.²⁶ Presuming the outside wage reflects marginal product, this leads to an equilibrium with surplus labor allocated to peasant farming. The weak link in these early depictions is now understood to be the implicit role assigned to capital (see Stiglitz, 1969). Suppose that the individual is able to rent out his or her portion of the capital upon leaving the family farm, for a rent equal to the marginal product that the land would generate if he or she remained at home. Even the selfish person will then balance only the marginal product

²⁶ Bhattacharyya (1985) finds a positive coefficient on the average product of labor in agriculture, given a negative role for local wages, in estimating an aggregate rural-to-urban migration function for India. This he interprets as reflecting the selfish family's interest, rather than the individual's, in making the migration decision, on the grounds that if the migrant had stayed at home he or she would have consumed the average product. An alternative interpretation might derive from the role of greater average product in enabling costly migration to be financed.

of his/her own labor at home against the outside wage.²⁷ Surplus labor does not persist. On the other hand, if no market for renting out or selling land exists, if the individual would be denied rights to all or some portion of the land upon departure, or if the marginal product of the assets would be less in the absence of the individual, the rents are effectively tied to presence. In the extreme case, when no rent would be generated upon departure, if the household shares equally while together and the individual acts selfishly, the average product wage returns. Indeed even if the division of property rights generates a rent to the individual, but a rent less than the marginal product of the land, then surplus labor remains (Manove et al., 1987).

There are circumstances, in developing countries, under which individuals indeed lose their right to assets upon departure. For instance, under tribal land schemes in Africa, it is not uncommon to reassign land which is not operated by a person or family. Similarly, members of cooperatives may not have the right to compensation to their implicit portion of the assets upon withdrawal. To what extent individual households operate in this fashion is much more difficult to detect.

A second class of cases must be distinguished, namely the instance when the marginal product of a locally specific asset is affected by the presence of a particular person or persons. For instance, knowledge about the idiosyncrasies of family land may result in a potential rent to outsiders which is less than the marginal product of the land to the specific family, assuming that no device exists for perfect transmission of knowledge. (For evidence in an Indian context, see Rosenzweig and Wolpin (1985)). More generally, any locally specific knowledge, which cannot be marketed while absent, tends to tie an individual to a particular place (Jagannathan (1987) refers to local contacts and other investments in local information as social assets). This more general form has not been subject to systematic tests.

2.6. *Temporary, return and permanent migration*

Explanations for temporary, and especially circular migration may broadly be divided into two. The first provides a link with the foregoing section on capital, for temporary migrants are often characterized as target savers with a specific investment in mind (including marriage or education of children, as well as saving for a home, land, item of capital, or retirement) (Nelson, 1976). Such target savers are viewed as intending to return from the outset, perhaps because of a preference for living at home, or because the cost of living is lower in the rural area of origin (see Fan and Stretton, 1985). A second explanation postulates that return migrants may not have intended a temporary move: these migrants may include those whose perceptions of the destination failed to materialize, those who proved unlucky in their gamble for a job, or whose tastes changed to the detriment of living in the destination area. Distinguishing between

²⁷ This assumes constant returns to scale so that Euler's theorem holds.

these two major alternatives presents a major challenge to empirical research – a challenge not yet successfully taken up.

More attention has been given to the target saver model. Beringhaus and Seifer-Vogt (1988) develop a stochastic, dynamic programming model of a target saver migrant with incomplete information. An intent to be a temporary migrant may be transformed into a decision to remain permanently, in this model, if the host conditions render achieving the target impossible. This may well be mitigated in practice by learning and target adjustment on behalf of the migrant, but this is explicitly omitted from the model of Beringhaus and Seifer-Vogt. Galor and Stark (1990) model an interesting consequence of target saving. They hypothesize that migrants who are more likely to return to their initial lower income setting will have higher savings propensities, while in the host context, than do migrants who are less likely to return or, for that matter, than do identical natives. If return migration then does not materialize, high saving migrants accumulate more capital than the native born.

The statistical evidence on the causes of temporary migration is sparse. In his study of urban-to-rural return migration in Korea, Lee (1980: p. 148), concludes that “repulsion from the city rather than attraction in the rural origin is more important”, though this is founded upon reasons stated by returnees. Blejer and Goldberg (1980) find that most migrants returning from Israel do so after only a very short stay, and that unemployed immigrants and those withdrawing from the labor force as discouraged workers are most likely to return home. Despite the lack of systematic evidence, it does seem likely that in other contexts target savings represent an important component in the story, and surely so for international guest workers (Nelson, 1976; Lucas, 1988).

2.7. Family strategies

Much of the literature on migration in LDCs treats urban unemployment risk explicitly, but typically abstracts from rural risks. In most developing countries, this seems perverse. Droughts, floods, pests and world price fluctuations may well render agriculture a far riskier proposition than making a living in town (Stark and Levhari, 1982). Explicit crop insurance rarely exists in developing countries, in part because of the moral hazard involved. Instead, rural families seek alternative modes of insuring their incomes. One device for reducing the variance in family incomes is diversifying across alternative sources of income which are not highly, positively correlated. For instance, placing some family members in town and pooling village and town incomes may offer insurance both for the urban migrants and for those who stay in the village, if an enforceable mechanism for pooling is established. Indeed, risk averse families may gain from such a strategy, and hence migration may be observed, even if the mean and variance of incomes is identical in town and countryside and if no net transfer occurs – transfers between village and town occur according to the state of nature

in any given period but balance each other on average. This idea of families straddling the rural–urban divide is noted in a number of case studies (amongst others, see Corner (1981) on Kedah district, Malaysia; Curtain (1981) on Papua New Guinea; Shaw (1988) on Calcutta and Oberai et al. (1989) on Bihar, Kerala and Uttar Pradesh).

Lucas and Stark (1985) and Stark and Lucas (1988) estimate remittance functions for households in Botswana during a year of drought, in part to test for the presence of such insurance provision.²⁸ The incidence of drought is beyond the control of the family, and hence involves no moral hazard. Families living in the worst drought hit villages are not observed systematically receiving more remittances than others. Nor are low-income families. It therefore seems that pure altruism is not the major motive for remitting. However, families with more cattle and with larger cropping lands, in drought areas, do receive larger remittances. This is quite consistent with rural households assigning members to town in order to insure against investing in risky assets at home.

Lucas and Stark also explore another family understanding through their estimates of remittance equations. Remittances from all absentees are greater, the higher is the education achieved by the migrant. However, among the family's own young members (most notably females), likely to have been educated by the family, the rise in remittances with education is even greater. This suggests the possibility of an understanding that the family educates its young members in return for subsequent repayment. More generally, though not tested by Lucas and Stark, it seems plausible that education is part of an intertemporal arrangement; the family educates members in order for them to migrate and gain urban entry, ultimately to repay the family from town and hence finance subsequent education of younger family members (see Connell et al., 1976; Katz and Stark, 1985b).

A difficulty with such intertemporal understandings within the family, whether with respect to initial urban risk and continuing rural insurance or with respect to initial schooling, is enforcement after the educated urban migrant has passed the initial risky phase. To some extent, trust, tradition and altruism make the family a natural enforcement unit. Elder members of the family may also threaten to disinherit those who cheat. In support of this, Lucas and Stark report that families with larger cattle herds (the main form of hereditary wealth in Botswana) receive larger remittances from sons eligible to inherit, than from others.

Rosenzweig and Stark (1989) investigate another form of insurance sought by rural families through migration, namely intra-rural migration for marriage. Across six villages in central India, pairwise village correlations in monsoon rainfall, real agricultural profits and real agricultural wages over a ten-year interval are shown to decline significantly with distance between villages. In other words, risk spreading would be

²⁸ Intra-household transfers are not taken up systematically in this chapter, since they are dealt with in Chapter 12 of this volume.

possible by diversifying income sources across villages, especially villages far apart. Nonresident in-laws are a major source of income transfers during episodes of short-fall in India. Thus, placing in-laws in distant villages offers the potential for effective insurance. After noting the commonality of inter-village marriage, over a mean distance of 30 kilometers, Rosenzweig and Stark examine the extent of consumption smoothing achieved by individual households over a ten-year interval. The variance in household consumption is positively associated with the variance in profits from own land, indicating less than perfect smoothing. However, an interaction between this variance in profits and number of married women present, and a further interaction with marital distance, both prove to reduce the variance in consumption, which is consistent with consumption smoothing through migration for marriage. Rosenzweig and Stark also find that an increase in variance of profits on own land, instrumented to purge for the effects of moral hazard, is associated with an increased number of out-migrants and with marriage distance. On the other hand, greater inherited wealth is associated with shorter marital distance, perhaps reflecting the lesser need for insurance.

Behrman and Wolfe (1985) examine another aspect of marriage in relation to migration, namely the search for husbands in Nicaragua.²⁹ Micro data are deployed to estimate the micro decision among females in relation to labor market differentials, the demographic marriage market (the probability of a male companion) and the economic marriage market (the expected earnings of a companion). Options with respect to the explanatory variables are examined for three locations – Managua, other urban areas, and rural areas. For each location a prediction equation is estimated to provide measures on the three sets of explanatory variables. The problem of identifying separate effects is severe, for it is not obvious which explanatory variables can reasonably be excluded from the various prediction equations. As a result, the predicted values are highly collinear. In response, Behrman and Wolfe present estimates both including and excluding employment probabilities. When these are excluded, the labor market variables play an insignificant role, while both the demographic and economic marriage market variables prove statistically significant (though not always with the anticipated sign). If employment probabilities are incorporated, then the influence of the labor market in the migration decision is estimated to be greater.

As noted in the section on stylized facts, in Latin America rural–urban migrants are more likely to be female than male. This is also true in the Philippines, in which context Lauby and Stark (1988) offer an explanation rooted in a risk reduction strategy pursued by the rural family, rather than in an individual decision derived from either the job or marriage markets for women. In particular, Lauby and Stark argue that, at least in the Philippine context, although female migrants' earnings may be lower than

²⁹ Stark (1988) develops a number of interconnections between the labor market, migration and marriage, including the simultaneity of these decisions for an individual, some consequences of joint decisions of couples, and potential effects upon the stability of marriages.

males' they are also more secure, and that daughters remit more than sons from a given level of earnings. Placing daughters in town may thus offer greater security to the rural family than having sons migrate.

Rural families apparently can insure their incomes to some extent by placing either sons or daughters in town and by intra-rural marriage of children. It is then natural to proceed beyond considering the allocation of a given number of family members to inquire into the implications for family size. Katz and Stark (1985a) consider several comparative statics effects on the demand for children, precisely in a context where the family pursues a migration strategy to enhance utility derived both from income per member and from lower risk in this income stream. In general it proves difficult to sign effects, given potentially opposing forces. For instance, if the income of a child-migrant increases:

- the returns to an additional child are increased leading to a substitution effect enhancing the demand for children;
- family income is raised and, assuming diminishing absolute risk aversion, the income effect reinforces the increased demand for children to the extent that concern for higher mean family income dominates;
- but if concern to reduce risk in family income dominates, then the income effect works in the opposite direction – higher income reduces risk aversion and hence reduces the demand for child-migrants as insurance;
- the child-migrant is individually better off and may be tempted to break any implicit contract to support the rural family, presumably reducing the demand for children, though this may be more than offset to the extent that the child's altruism toward the family is a normal good.

These components also act in the same direction if the risk in the child-migrant's income is reduced.³⁰

Stark (1991b) notes several additional factors which may complicate this picture. The potential for migration can, for instance, increase the demand for children to enhance the bargaining position of the family vis-à-vis its migrant members: a larger pool of migrant members increases the credibility of threat to disinherit individuals and diminishes capacity for children to collude. Moreover, as Stark argues, if the core family receives declining marginal support for money invested in each migrant member, there is again an incentive to think of a large family.

Ultimately, signing the combined effect from such changes must consequently fall to empirical evidence. Such investigations must face a difficult problem in time, for any change in an urban migrant's income would only be realized through newborn family members with at least a 15-year lag.

Finally, under this heading of family strategies, the issue of conjugal separation – migration by one marital partner alone – is addressed. Single men apparently domi-

³⁰ Katz and Stark (1986d) extend this analysis to the case when the decision by the child whether and how much to remit is endogenous to the analysis.

nate rural-to-urban migration in Africa and Asia (Todaro, 1976b). Among those who are married, it is common to leave wives at home in the village. Usually this is part of a temporary migration pattern, with visits or more permanent return by the husband, or subsequent urban settlement by the wife and children (Nelson, 1976). Often the period of separation is depicted as a source of hardship for the wives in particular (Colfer, 1985), though it is not always clear they are economically worse off if they receive some remittances from an absent husband, or are able to increase their control over, and share of, the rural generated income.

Banerjee (1984a) notes, from his sample of male migrants in Delhi, that 30% of married rural-to-urban migrants are not living with their wives, while this is true for only 7% of inter-urban migrants. Focussing on the rural-urban migrants exclusively, Banerjee estimates a linear probability function, with the dependent dummy variable indicating whether the wife is with the husband or not. Banerjee finds that conjugal separation declines with the level of education of the migrant, a U-shaped pattern is found with respect to duration of residence in Delhi, and an inverse U-shape for age when first moved. The turning point in the quadratic on duration of residence is estimated to occur after 60 years and the positive portion is therefore irrelevant. Whether the tendency for longer term residents to have their wives with them reflects subsequent reunification in town, higher return migration by men separated from their wives, or a secular trend cannot be discerned from these results. The inverse U with respect to age at time of arrival also does not turn down until age 66. Conjugal separation is thus less likely to occur the younger is the male upon arrival in town, which could reflect a pattern of younger arrivals finding an urban bride, of adopting urban attitudes, or of accumulating sufficient savings to bring a village bride to town.

The theoretical literature on family strategies – linking migration with such issues as fertility, education, marriage, inheritance, and risk spreading – has proved very fruitful in the last few years. However the empirical literature still offers no more than a few isolated examples. Replication or rejection of results in other contexts should be a high research priority. In so doing, it may prove fruitful to explore the implications of estimating a fully simultaneous model in which the multiple implications of a family migration strategy are treated as endogenous in an intertemporal framework, though the resultant identification problem will no doubt prove difficult (Moreland, 1982).

2.8. The contextual setting

Much of the early economics literature on migration decisions focussed exclusively upon the individual potential migrant. The preceding section reviews some of the more recent literature emphasizing the role of family strategies in shaping the nature and extent of migration. A substantial sociological literature emphasizes yet a third

level of factors, namely the influence of the sending community upon migration decisions.³¹

This is particularly true with respect to case studies on the variation in impact of rural development programs on placement of family members outside of the village. Several contributors agree that variations in the contextual setting of these programs cause substantial differences in responses (Brown and Sanders, 1981; Harbison, 1981; Hugo, 1981a; Roberts, 1982, 1985).

Findley (1987) estimates a binary logit equation on migration decisions of individuals in the Ilocos Norte region of the Philippines, including a number of indices representing the contextual setting. These indices include previous community migration, a community development index, accessibility to town, measures of community agricultural commercialization and municipal facilities available. Findley finds little direct effect from these measures, but they do prove statistically significant in interaction with a vector of family characteristics, though not all coefficients have signs consistent with the author's priors.

Many of these contextual variables may have effects readily interpreted within the models of economists, acting for instance through information availability (prior migration and access to town), tightness and risks in the local labor market (commercialization and community development), and costs of relocating (access to town again). Nonetheless these measures are not often included in empirical studies of migration by economists (see, however, Connell et al., 1976).

An exception to this comparative neglect is the recent literature on relative deprivation. Stark (1984) hypothesizes that the village represents a stable reference group for rural-urban migrants, at least initially. A person who is poor relative to his home village reference group may elect to migrate to town in order to improve his ranking relative to the home group. On the other hand, a person who is even poorer, yet relatively well off compared to others from his particular village, may not move for the same level of gain, if his utility is sufficiently strongly influenced by his ranking relative to his reference group. This framework offers an interesting dynamic feature; removal of the relatively deprived from a community lowers the relative position of some of those remaining, which may consequently engender further migration. Over time, also, the reference group of migrants is likely to shift to their urban setting, but this may not worsen the migrant's sense of well-being if the reference group is formed from other urban migrants from a similar setting, for with the continued inflow of migrants earlier migrants are usually those who are better off. Nonetheless the change in reference group could leave the migrant more deprived relative to this new group and Stark and Yitzhaki (1988) accordingly distinguish between weak and strong

³¹ Brown and Jones (1985) interact the coefficients of a fairly standard macro regional migration equation with the map coordinates at origin, for intercantonal migration in Costa Rica. The coordinate effects are used to map spatial variations and the authors argue that the observed geographic differences can be related to the contextual development patterns.

conditions for migration, the former referring to cases in which an absolute gain in income may occur but the migrant is relatively deprived by migration, or vice versa.

Stark and Taylor (1991) include a measure of relative deprivation in a multinomial logit equation for individuals' decisions to stay at home, to emigrate, or to relocate internally from 61 village households in Mexico.³² The relative deprivation index is found to affect emigration from Mexico significantly but not internal migration, which the authors assume reflects the likelihood of shifting reference group under internal migration but not in relation to foreigners in the emigrant's host country.

2.9. Displaced persons

Extreme instances of the relevance of contextual settings in affecting migration are the flight of refugees and of displaced persons moving within international borders.³³ The number of migrants designated to be internally displaced persons has risen sharply in recent years, as individuals and families flee from violence and ecological disasters. According to the *World Refugee Survey 1992* even a partial list of the internally displaced includes 23 million people, and the total number is undoubtedly much higher.³⁴ To what extent the sharp increases in reported numbers represent a real rise or a change in recognition is unclear. Indeed, although international legal definitions of refugees and displaced persons exist, there is frequent dispute as to which term applies in a specific context and statistical information on the internally displaced is fragmentary.

Despite the apparent growing number of displaced persons, economists have had almost nothing to say about them. To some extent this is because the movement of displaced persons is perceived as a political rather than an economic problem, though disentangling the two is not always easy (Barnum, 1976). An exception is the study of interregional migration in Colombia by Schultz (1971), which reports estimates of macro, net, migration equations incorporating both a measure of local wage and of the rate of local politically motivated homicide from 1958 to 1963. Both prove significant in affecting rural out-migration. In fact in separate estimates for various gender-age groups, the only category for whom out-migration is not increased significantly by heightened rural violence are males age 17 to 21 – the violence makers.

Gottschang (1987) looks at the movement of eight million people from Hebei and Shandong provinces of China to Manchuria from 1890 to 1946. The flow of migrants

³² The index of relative deprivation adopted for a person with income y is the product of $[1 - \Phi(y)]$ – the fraction of population in the reference group having incomes greater than y – and of $E\{\psi - y \mid \psi > y\}$ – the mean income of persons with income greater than y .

³³ For a survey of the literature on international refugees in Sub-Saharan Africa (both the major source and host of refugees), see Russell et al. (1990).

³⁴ See US Committee for Refugees (1992: p. 34).

is shown to rise during years of disaster (some of which are ecological) in the sending area, but this effect is not statistically significant.

3. Effects of migration on production and inequality

Models embedding migration, and most notably rural–urban migration, in a general equilibrium framework are distinguished by three main dimensions: by their assumptions about rural and urban labor market operations, by treatment of the short and long runs, and whether they are static or dynamic. The following two sections deal with static models, both short and long run, focussing upon rural labor market issues and agricultural production in Section 3.1 then turning to urban labor market pathologies in Section 3.2. In both instances, evidence with respect to some of the distinguishing features is dealt with, as well as the basic theoretical ideas including the ranking of policy instruments. Section 3.3 covers dynamic models incorporating migration and Section 3.4 then turns to the much disputed effects of rural–urban migration upon income inequality.

3.1. Rural labor markets and agricultural production

If all markets were perfect then labor migration, and rural–urban migration in particular, would simply reflect an efficient transfer of resources. In practice, trade barriers imposed by LDCs normally offer higher effective protection to industry than to agriculture. This may well translate into an incentive for an excess allocation of labor to industry, as compared to the Pareto optimum, unless the industrial protection can be justified by some other form of market failure. Although the distorting effects of trade protection are both common and major factors in affecting the inter-sectoral allocation of labor, they are rarely discussed within the migration literature (Lipton, 1977). Rather the chief departures from perfect markets examined in labor migration theory are various pathologies arising in the labor markets themselves. Typically, this takes the form of examining a single departure from perfect markets at a time, studying its comparative statics effects, and ranking optimally applied policy instruments.

The earlier literature typically assumes perfect urban labor markets and considers various potential failures in the rural labor markets. A full treatment of this literature on rural labor markets in developing countries is well beyond the scope of this chapter. This material is well summarized elsewhere (see Rosenzweig, 1988). Nonetheless at least some of the important dimensions, insofar as they impinge upon migration in particular, are worth sketching briefly here. In particular, three potential problems are summarized: “surplus” rural labor, sharecropping, and nutrition wages. This section also discusses some of the potential long-run effects of rural out-migration upon agricultural production through induced changes in technology and investments.

3.1.1. *Surplus labor*

Both families and collectives share incomes, though not necessarily equally. In the early theory of both peasant households and of collectives, equal sharing was thought to give rise to a market failure.³⁵ It does not. Rather, the source of any market failure stems from the absence of transferable property rights, tying individuals to specific locations in a manner which may be neither efficient nor equitable (see Section 2.5.2 of this chapter). In this event, establishing transferable property rights normally represents the first-best solution. In the event that the associated administrative costs prove prohibitive, or if the distributional consequences are unacceptable (as perhaps in enclosure of communal land), then some form of urban employment subsidy may be warranted.

Testing for whether surplus rural labor exists, in the sense of exhibiting a lower (social) marginal product than in town, is complicated by several factors.³⁶ (i) The marginal product of labor in LDC agriculture is highly seasonal. The marginal product foregone with the withdrawal of a migrant then depends in part upon whether the migrant is able to return temporarily during peak seasons (Connell et al., 1976). Indeed, in some contexts, urban employers have organized hiring accordingly around peak seasons, in an attempt to reduce the opportunity cost and hence the supply price of migrants (Lucas, 1987). (ii). Departure of a migrant may induce remaining family members to work additional hours (see Sen, 1966) and the evidence summarized in Rosenzweig (1988). In this case, output foregone upon departure is not appropriately measured while holding all other labor inputs constant. However, the leisure foregone by remaining family members clearly represents an opportunity cost to migration not reflected by comparing marginal products alone. (iii). Out-migration is selective. Measuring the marginal product of a typical rural laborer may thus misrepresent the output foregone upon migrant withdrawal.

3.1.2. *Sharecropping*

Various forms of share-tenancy continue to be common in many developing countries.³⁷ By sharing a fixed fraction of output with the landlord, a share-tenant receives only a fraction of his or her marginal product. It is as if the tenant's income were taxed, and the result is to discourage labor supply to share-tenancy. Several models consequently depict an inefficient allocation of labor between share-tenancy and elsewhere. Although these models do not explicitly address the implications for migration,

³⁵ For a review of the literature on collectives, see Bonin and Putterman (1987).

³⁶ Unfortunately most of the early tests for surplus labor ask whether the private marginal product of labor in agriculture is positive. This is hardly the point; the marginal product of labor in agriculture can be below that in industry even if positive.

³⁷ Not only is share-tenancy common in arable farming, but in parts of Africa animal husbandry is organized on a very similar basis (see Hertel, 1977).

they are nonetheless of relevance for the implication is that excess migration occurs from areas where share-tenancy is common. It is therefore worth briefly pausing to outline some of these issues with respect to efficiency of labor use under share-tenancy.

One argument is that, in the absence of complete insurance markets, share-tenancy offers a device for risk-sharing between risk averse tenants and (perhaps) risk neutral landlords. If the only source of uncertainty is in the level of agricultural output, then share-tenancy offers no additional protection as compared to some combination of fixed rent leases and fixed wage labor operation by the landlord, the former leaving the tenant as sole bearer of all risks, the latter leaving the landlord as residual risk taker.³⁸ Rural wage labor markets are also uncertain, and share-tenancy may then represent an efficient mechanism for sharing the combined risks from production and wage income (Newbery and Stiglitz, 1979). A second argument stems from the fact that wage labor needs to be monitored, while sharecroppers have an incentive to work hard given that they receive a portion of their production. Given the real costs required to supervise wage workers, share-tenancy may well again represent an efficient arrangement, obviating any need to discuss excess rural out-migration (Lucas, 1979). Eswaran and Kotwal (1985) extend this to a model in which the landlord also possesses asymmetric information with respect to management decisions, and share-tenancy represents a Pareto-efficient exchange of supervision and managerial talent.

3.1.3. *The nutrition wage*

Several models of rural–urban migration incorporate urban unemployment. Few address rural unemployment. Whether this is appropriate probably varies with the context, for extensive rural unemployment is not ubiquitous.³⁹ Nonetheless a substantial literature exists on the nutrition variant of efficiency wage theory, with particular reference to rural labor markets (Leibenstein, 1957; Rodgers, 1975; Bliss and Stern, 1978; Weiss, 1990). The essential idea is that labor costs may be minimized by setting a wage above labor market clearing, since the effort workers are able to deliver may be enhanced by better nutrition affordable at higher wages, particularly in very low income regions. With resulting unemployment in rural areas, the concept of surplus rural labor is resurrected, though in another guise. Indeed, in this context, migration from rural to urban areas could actually serve to increase rural output, for with fewer rural inhabitants to feed, nutrition among those remaining in the rural areas could rise, permitting higher levels of effort (Rosenzweig, 1988). Yet whether the first-best pol-

³⁸ This assumes constant returns to scale, so that there is no difficulty in dividing plots between alternative modes of production.

³⁹ Measured rural unemployment rates are very sensitive to the definition of unemployment adopted, especially where part-time and seasonal work are common. Rural unemployment rates may also be sensitive to proximity to urban areas (permitting more effective urban search from a rural base). See Bardhan (1977) and Rosenzweig (1988) on India, Lucas and Verry (1990) on Malaysia, Dickens and Lang (1991) on Sri Lanka.

icy prescription is to promote migration depends critically upon whether nutrition wage issues are of relevance in the urban sector too.

The usual recommendation in terms of policy prescriptions is some form of wealth redistribution, since non-labor incomes can raise nutrition, permit payment of lower wages, and enhance employment levels (Dasgupta and Ray, 1987). However, wealth redistribution, whether in the form of land reform or food aid, is notoriously difficult to effect, as is the alternative of subsidizing rural wage employment.

How relevant are nutrition wage theories in practice? Reviewing the evidence, Rosenzweig (1988: p. 720), concludes "... it is unclear if the model has any relevance to any known population on this planet". For instance, one of the more common pieces of evidence cited in favor of the nutrition wage hypothesis is that permanent agricultural workers are sometimes paid higher wages if they have larger families and hence more dependents to share their food. Alternatively, one can imagine that workers with larger families might be more responsible, work more diligently and thus merit higher pay. But causality may easily run in the opposite direction: higher wages may encourage higher fertility levels (Rosenzweig, 1988). Moreover, at least in parts of India, permanent laborers are apparently often paid higher wages if they have larger families who help during peak seasons (Lucas, 1982).

3.1.4. Remittances, risks and new technologies

The short-run impact of rural emigration addresses only a part of the potential effect of out-migration upon agricultural production. Section 2.7 on family strategies outlines how placing family members in town or in more distant rural areas, can help to spread risks. The additional security may encourage adoption of riskier techniques in agriculture, resulting in productivity gains through technical progress (Stark, 1978). Moreover, investments made possible by migrants' remittances, or merely by the higher earnings of migrants, can increase output per worker in agriculture through capital deepening.⁴⁰

There is far less evidence on the long-run effects of rural out-migration upon agriculture than on the short-run issue of surplus labor. Rempel and Lobdell (1978) argue that net remittances are too small to have much effect on enhancing rural productivity, and that remittances are in any case not normally spent on productive investments. Similarly, Banerjee (1984c) notes that of male migrants in Delhi whose families have undertaken some agricultural improvement, "only" two-thirds are remitting, though no control group is analyzed to see if this rate of improvement is abnormal. As Stark (1980a) notes, however, no remittances need occur to encourage investments and adoption of more productive techniques: the insurance provision, additional income of family members, and possibly the relaxation of a binding cash constraint on the

⁴⁰ Katz and Stark (1986a) consider the migration implications of a case when the returns to such investments increase with the scale of investment.

household, can induce these changes even without remittances; remittances spent on housing and schooling are productive investments; and anyway the additional income from remittances is fungible, and investments may well increase even if the actual cash remitted is not invested.

As a result, the long-run effects of out-migration upon rural production are difficult to test empirically. Lucas (1987) applies annual time-series data to estimate arable production functions and cattle accumulation equations for several countries in southern Africa. Included in the explanatory variables is the accumulated earnings of migrant mine workers, which in all but one case prove to increase both crop output and cattle herd size significantly. Thus, although migrant withdrawal is shown to diminish crop output in the short run, investments made possible by migrants' earnings may at least help to offset this in the long run.

3.2. *Urban labor market issues*

In discussing urban labor market pathologies it will be useful to distinguish between models in which the failure of labor markets to clear is a result of policy intervention and those in which private wage setting mechanisms are the underlying cause.

3.2.1. *Models with government intervention*

First-best solutions. The basic tenets underlying the Todaro hypothesis have already been described. Harris and Todaro (1970) set this hypothesis, of migration induced by more effective job search, within a general equilibrium model. The Harris–Todaro model depicts a static, short-run equilibrium for a two-sector, small, open economy. The rural labor market is presumed to be perfect but the urban wage is set by government at a level above clearing. For the moment, we may refer to this as a minimum wage. Since the only imperfection introduced into this model is the minimum wage, the first-best policy, ignoring distributional issues, is to remove the minimum wage restraint.

What are the consequences of lowering the minimum wage without removing the restraint entirely? In the short run, lowering the urban minimum wage obviously stimulates urban employment and hence urban output in this model. The induced change in rural production is ambiguous. Whether rural production expands or contracts depends in the short run solely upon whether the rural wage is lowered or raised. In the static equilibrium, migration equates the rural wage and the expected urban wage, but the latter has two components, the minimum wage and the probability of urban employment, and whether the expected urban wage moves in the same direction as the minimum wage depends upon the elasticity of demand for urban labor.⁴¹ Thus,

⁴¹ For an elegant diagrammatic exposition see Corden and Findlay (1975).

if the rural wage (w_r) equals the urban minimum wage (w_u) multiplied by the probability of an urban resident holding a job as given in Eq. (2), then

$$w_r = w_u \frac{e_u(w_u)}{1 - e_r(w_r)}, \quad (7)$$

where e_u and e_r indicate urban and rural employment respectively and the total labor force is normalized to equal one. Differentiating with respect to the urban minimum wage and rearranging gives

$$\frac{\partial w_r}{\partial w_u} = \frac{(1 - e_r)e_u(1 + \eta_u)}{(1 - e_r)^2 - w_u e_u e'_r}, \quad (8)$$

where η_u is the urban elasticity of demand for labor and e'_r indicates the derivative of e_r with respect to w_r . The denominator and the first two terms in the numerator in Eq. (8) are positive. Consequently whether w_r (and hence rural employment) rises or falls with w_u depends upon the sign of $(1 + \eta_u)$. If urban employment is wage inelastic then lowering the minimum wage creates few additional urban jobs. The combined effect of a lower wage and few extra jobs discourages migrants, reduces rural-urban migration, and rural output expands together with urban output. On the other hand, if urban employment is wage elastic then rural production falls with a declining minimum wage. Indeed, despite the expansion in urban production, total production may even decline. As one should expect from the general theory of the second best, although removing the minimum wage unambiguously enhances production, the effect of lowering the minimum wage depends upon the context.

In the long run, when capital is mobile between sectors, imposition of an urban minimum wage can even serve to increase urban production. Corden and Findlay (1975) illustrate this point by considering a fixed coefficient technology. Imposition of a minimum wage does not then reduce employment with the initial capital. The higher wage with initial full employment attracts migrants, and the reduction in rural labor leaves some agricultural capital idle. Both capital and migrants are consequently diverted from the rural to urban sectors and urban output expands. Nonetheless, the first-best solution is to remove the minimum wage.

Drazen (1986) presents a model in which removal of a minimum wage may not be first-best (irrespective of capital mobility). The Harris-Todaro model assumes complete information. Drazen depicts a scenario of asymmetric information, in which the quality of the pool of urban arrivals is positively affected by the average urban wage. No atomistic firm is willing to raise its wage to the social optimum level since free-riding firms also benefit from the enhanced pool attracted by these pay increases. Thus, Drazen maintains, a minimum wage regulation may be desirable to circumvent the externality, despite the induced migration and resultant unemployment. As Drazen

notes, this failure arises only if employers cannot write a binding contract offering a higher wage conditional upon applicants passing a test. Whether such pathologies are sufficiently common, and whether policy makers are sufficiently astute in setting minimum wages, to justify the common regulations, are not obvious.

In practice, minimum wage regulations are not the only means by which policy-makers impose a floor on wages. Public sector hiring, whether in public services or state owned enterprises can have a very similar effect. For instance, if public sector pay is higher than in the private sector, and if government is unwilling or unable to hire all comers at going public pay levels, then open unemployment and induced migration for public sector job search may ensue. Indeed, given the difficulties of enforcing minimum wage laws and the comparatively large public sector employment in many developing countries, the effects of public sector hiring may be far more influential. Whether the public sector pays more or less than the private sector, for similar employees, seems to vary from one LDC to another (Heller and Tait, 1984). Standard human capital earnings equations are found to exhibit positive coefficients on appended public sector dummy variables, at least in some contexts (see Lindauer and Sabot (1983) on Tanzania, Lucas and Verry (1990) on Malaysia). However, as always, unmeasured attributes could underlie these results: government may hire the brightest among those with equal quantities of schooling. Moreover, such earnings equations do not reflect differences in job content and prospects (Robinson, 1990). In principle, if public sector pay does induce urban unemployment and migration out of productive rural activities, then lower pay levels represent the first-best solution. However adjusting to lower levels may prove politically impractical. In consequence, a very wide range of alternative policy instruments has been explored in the literature. Chief amongst these are wage subsidies.

Wage subsidies. Application of even the best feasible wage subsidy to the urban sector alone may reduce total production in the Harris–Todaro model. Ignore, for the moment, issues of financing this subsidy. In the short run, a wage subsidy to the urban sector lowers labor costs, expanding urban employment and hence urban output. At the same time take-home pay for urban workers remains unchanged. Combined with higher initial urban employment levels, this induces additional migration resulting in diminished rural production, which may more than offset the expansion in urban production and may even increase the rate of urban unemployment.⁴² The transfer of labor from rural to urban production lowers the returns to capital in the countryside while raising returns in town. In the long run, capital is transferred out of agriculture,

⁴² On the short-run production effect, see Harris and Todaro (1970). The conditions under which the unemployment rate is raised have been disputed (Zarembka, 1970; Todaro, 1976a; Blomqvist; 1978). For a resolution, see Arellano (1981), who shows that the formulation of migrant supply responses to urban job creation (given wages) is critical. See also Stark et al. (1991).

lowering the rural wage and, since take-home pay is fixed in town, equilibrium occurs at a higher rate of unemployment.⁴³

Continuing to ignore the problem of financing wage subsidies, Bhagwati and Srinivasan (1974) show that a first-best solution can be achieved by applying an equal rate of wage subsidy to both sectors.⁴⁴ For migration to cease in the absence of unemployment requires that take-home pay in both sectors equal the minimum wage. For the marginal product of labor to be equal everywhere also requires that labor costs be the same in both sectors, and an equal wage subsidy must close the gap between pay and costs.

Unfortunately this delightfully simple solution is rendered impractical by the need to finance a universal subsidy and by the difficulties of administering a rural wage subsidy.

Ranking policy instruments. A series of contributions evaluate two related issues when first-best policy options are not available and an urban minimum wage restriction prevails: ranking the distortionary effects of various forms of taxation just sufficient to finance optimal wage subsidies; and the social welfare ranking of policy instruments other than wage subsidies (Khan, 1980; McCool, 1982; Bennett and Phelps, 1983; Lundborg, 1990).

Among the policy instruments considered within this literature are production subsidies, trade taxes (with and without consideration of consumer losses), and taxation of urban incomes (as a form of migration tax). Both the short-run and long-run implications of such instruments, applied at their second-best optimal rates, have been considered. Unfortunately the consequences of applying taxes to finance optimal wage subsidies and of using corrective policy instruments other than wage subsidies prove sensitive to several factors. These factors include: the factor intensities of the two (or more) sectors; which good is imported and the elasticities in demand for exports and supply of imports; and since consumer prices are affected by some of the policies, it matters whether the minimum wage is defined in terms of agricultural goods, urban goods or nominal values. Not only is the order of social welfare ranking affected by these factors, but in some instances whether a tax or subsidy is to be recommended depends upon assumptions with respect to these elements.

The model of Bennett and Phelps (1983) is particularly interesting in depicting the rural household straddling the urban divide through migration: when nominal wages

⁴³ See Corden and Findlay (1975). Khan (1980) shows that, in this long-run model, a sufficient condition for the existence of an equilibrium is that the rural sector be more capital intensive than the urban sector, which seems unlikely.

⁴⁴ The large country case is analyzed in Srinivasan and Bhagwati (1975). Anand and Joshi (1979) reanalyze the small country case, in the context of a Benthamite social welfare function, when revenue constraints prohibit achieving equal take-home pay in both sectors. Shukla and Stark (1990) combine the small country case with urban agglomeration externalities. Obviously equal wage subsidies to both sectors do not prove to be the first-best solution in any of these situations.

increase less than in proportion to the cost of living, a devaluation proves less costly in its effect upon rural employment per urban job created, than do (unproductive) urban public works, an urban employment subsidy, an import tax on the urban good or an export tax on the rural good. What seems to drive this result is the effective cut in real wages as a result of the devaluation, a resulting loss in real urban incomes provided the urban demand for labor is inelastic (thus making urban migration less attractive), and an elastic demand for rural exports (given the small country assumption). On the other hand, if the real urban wage is rigid, then devaluation has no effect upon urban employment in the Bennett–Phelps model. Clearly the responsiveness of wages to cost-of-living changes is a crucial element (a common result in the analysis of real effects of devaluation), and the next section turns from government administration of wage setting to private determination.

3.2.2. *Models with wage setting by unions and firms*

Two models of unregulated, non-clearing, private sector, wage setting are covered in this section: collective bargaining and efficiency wages. The literature on efficiency wages has not really addressed migration considerations directly. Nonetheless, efficiency wage models and their policy implications are of quite direct relevance in the present context. Policy recommendations must depend upon an understanding of any market forces which sustain urban formal sector wages in the presence of open unemployment or of competition from low-wage informal sector jobs. At the moment, the various efficiency wage models probably offer the most popular explanations for this phenomenon, and as such deserve attention here.

Collective bargaining. Calvo (1978) suggests that LDC trade unions act to maximize the product of urban employment and the difference between urban and rural wages. Two scenarios are posited. The first is similar to the McDonald and Solow (1981) monopolistic framework, in which the union sets wages and employers determine the employment level accordingly. The second approach envisions a Nash equilibrium, permitting firms to react. In both scenarios, because of the assumed union objective, urban wages exceed rural wages in equilibrium and open urban unemployment provides a migration equilibrium.

In Calvo's models, neither a wage subsidy (in one or both sectors) nor an income (migration) tax is capable of achieving a first-best solution in which output is maximized and unemployment disappears. In essence, unions care about after-tax pay of members, and, by always seeking to sustain a gap between rural and urban take-home pay, thus prevent full employment from being reached.

Calvo's model does not appear to have been tested empirically, although as Calvo notes:

... the existence of an entity acting as [a trade union] is not strictly necessary for this model to have empirical relevance. Similar situations may arise in the absence

of a [trade union] if, for example, the government happens to be concerned, for political or other reasons [with] the welfare of urban workers and/or ... the attractiveness of the city. (Calvo, 1978: p. 80.)

Certainly urban-rural wage differentials appear to be more ubiquitous than organized labor. More generally, inter-industry wage differentials, which cannot be explained by differences in collective bargaining, persist – a point which has attracted the attention of efficiency wage testers.

Efficiency wage models. At present, the most widely accepted explanations for non-clearing wage setting by profit maximizing employers are several variations on the efficiency wage model. In brief, labor costs are hypothesized to fall as wages rise over an interval of lower wages, after which labor costs rise with wages. Employers pick the wage which minimizes labor costs. Several reasons are offered for the U-shape pattern of labor costs against wages, in addition to the nutrition wage variant which has already been discussed: shirking may be averted by the threat of losing above market wages; costly turnover of employees may be reduced by offering higher wages; or the average quality of job applicants may be improved by offering higher wages only up to a point, after which high wage offers attract at least some less qualified applicants hoping not to be screened out.⁴⁵

If payment of efficiency wages in the urban formal sector, but not elsewhere, is the source of persistent wage differentials between town and village, or indeed between the formal and informal urban sectors, what are the policy implications? There are no easy answers. As Weiss notes:

For the incentive model, one might consider direct subsidies to the industrial sector ... [However] it is not uncommon for different efficiency wage models to have opposite policy implications... While it is clear that the market equilibrium is unlikely to maximize aggregate output, it is by no means clear whether any particular policy intervention will do more good than harm. (Weiss, 1990: p. 102.)⁴⁶

Testing for the general relevance of efficiency wage models proves difficult, as does identifying which variant underlies the effect. Krueger and Summers (1988) demonstrate that inter-industry wage differentials within the US cannot be adequately explained by the extent of union organization or threat, by measured human capital of employees, by unmeasured attributes of employees (examined through a fixed effects model), or by compensating variations. As Krueger and Summers conclude, this at

⁴⁵ See Stiglitz (1974, 1976) and Weiss (1990). Katz and Stark (1987) note that the lack of specific information about potential employees, and hence the relevance of wage setting to the quality of applicants, may be particularly acute among (international) migrants.

⁴⁶ Most efficiency wage models call for some form of wage subsidy. On the other hand, a wage tax may be called for in the context of the wage-sorting variant. See Weiss (1990).

least leaves room for the unexplained, residual inter-industry variation in wages to reflect some form of rent sharing and efficiency wage payments in particular. Similar evidence is reported for some developing countries (Gatica et al., 1990; Romaguera, 1991). In fact, the inter-industry structure of wages is remarkably similar across developed and developing countries, which may offer some support to an efficiency wage view (Lang and Dickens, 1992). However there are skeptics. Moll (1992) argues that inter-industry wage differentials are highly correlated between black and white workers in South Africa, and that in the South African context it is difficult to envision voluntary rent sharing with black employees, but Moll's evidence does not contradict the possibility of efficiency wage payments to prevent shirking by both races.

Brief mention may also be made of a common argument that transnational corporations pay above market clearing wages in the developing countries. Again, this literature has not been specifically tied to migration considerations, but is of quite direct relevance in weighing policies to redress the inefficient division of labor and hence migration between sectors. For instance, Lim (1977) reports that in Malaysian industry, foreign owned enterprises pay higher basic wages and higher shift premia, both on average and in regressions controlling for sectoral capital intensity. In principle this could reflect some form of efficiency wage premium paid by transnationals (who may possess less complete information about local employees). However Lim's evidence is drawn from enterprise level data which do not report skills or personal characteristics of employees. The only test of a foreign ownership wage premium based upon earnings equation estimates for individuals appears to be for the Tanzanian manufacturing sector by Knight and Sabot (1983). Knight and Sabot also find a positive effect associated with a foreign ownership dummy, but the effect is both small and statistically insignificant. Indeed, even had Knight and Sabot found a significant positive effect, one could not be sure if this really reflected unmeasured personal characteristics – especially if foreign companies hire the best and the brightest: thus, Knight and Sabot do find that foreign companies in Tanzania pay higher returns to both education and experience.

In sum, appealing as the efficiency wage arguments may be, evidence of their importance (in the developing world or elsewhere) is difficult to glean. Distinguishing which variant on efficiency wages is responsible for wages sustained above full employment clearing levels is even more difficult, and unfortunately this matters to appropriate directions for policy design. Recommending policy action to counter any associated misallocation of labor, including excessive or inadequate rural–urban migration, would therefore seem premature.

3.2.3. *The shadow wage of urban labor*

A very common form of (implicit) employment subsidy in developing countries is public sector staffing in excess of the cost minimizing criterion indicated by the prevailing wage. To ask whether this is inappropriate, and more generally to evaluate

both public and private projects, as well as to choose an optimal production technique, requires some measure of the shadow wage of labor (Aharoni, 1986).

Harris and Todaro (1970) maintain that despite persistent urban unemployment, the shadow cost of urban labor equals the going wage. If the urban unemployment rate is not altered by the creation of an additional urban job, it follows that $1/p$ additional workers must join the urban labor force, where p is the (constant) proportion of the urban labor force employed. Assuming further that the social cost of labor withdrawn from the rural sector is the rural wage, w_r , the opportunity cost of an additional urban job λ is simply:

$$\lambda = \frac{w_r}{p}. \quad (9)$$

However, from the Harris–Todaro migration equilibrium condition – that the rural wage equals the expected urban wage as in Eq. (5) – it follows that λ equals the urban wage.

Foster (1981) places this result in a broader context, suggesting that job search in the Harris–Todaro model may be seen as one form of rent seeking.⁴⁷ When rent seeking is competitive, Foster argues that the value of any good equals the cost of resources used both in production and in associated rent seeking, and “there should be no correction to the factor cost of a project to account for changes in rents” (Foster, 1981: p. 177). Heady (1981) also shows that the Harris–Todaro result is robust to some alternative job search scenarios, incorporating a potential spell in the informal sector, given risk neutral utility maximization by workers.

Other generalizations do cause a breakdown in the simple Harris–Todaro shadow price rule. If creation of an additional urban job lowers the urban unemployment rate, thus within the Harris–Todaro framework raising the rural wage, then the shadow urban wage is below the going urban wage (Heady, 1981). In particular, in a world of heterogeneous households, some are more likely to migrate than others. For additional migrants to be tempted to migrate requires lowering the unemployment rate, and infra-marginal (prior) migrants gain (Scott et al., 1976). If workers are risk averse, then less rural–urban migration is induced by urban job creation and the shadow cost of an urban job is below the going wage (Katz and Stark, 1986c). Even under risk neutrality, among the additional migrants tempted into town with the creation of one extra job, the job recipient receives a higher income and the rest receive lower incomes than previously. Under a diminishing marginal propensity to consume, Katz and Stark (1986c) show that the increase in consumption by the lucky migrant is outweighed by greater austerity for the unlucky migrants. In a society where savings are at a pre-

⁴⁷ Whether job search really represents directly unproductive rent seeking may be disputed if sorting into matching jobs is important.

mium, the additional savings thus resulting from the urban job again lowers the shadow cost of that job (Stark, 1981).

Obviously, the Harris–Todaro rule also requires modification if either the urban or rural wage is not equal to the marginal social value of production. This depends critically upon the nature of any distortions in these labor markets (Stiglitz, 1982). A wedge may also be driven between wage and social marginal product by distortionary taxes, including those imposed to finance wage (or other) subsidies. Indeed, in general when first-best solutions are not achieved, the costs of additional job creation are complex (Khan, 1980; Stiglitz, 1982).

3.3. *Dynamic models*

Essentially all of the general equilibrium models reviewed thus far are static. The transfer of labor from one sector to another may involve migration, if those sectors exhibit different geographic dispersion, but the focus is upon comparative statics once migration is complete. In contrast, the on-going flow of migrants is inherently dynamic (Lucas, 1976; Blomqvist, 1978).

A small number of dynamic growth models incorporating migration and urban unemployment have appeared. Robertson and Wellisz (1977), Jha and Lachler (1981) and Das (1982) all consider the steady state of a two-sector growth model, in which migration continuously equates the rural wage with the urban wage multiplied by the fraction of the urban labor force employed. Das shows that the second-best optimal savings rate (assuming that no policy action to achieve full employment is implemented) is greater than it would be under the full employment golden rule. Essentially this is because the higher savings finance additional capital which increases the demand for labor and reduces unemployment. Despite the urban unemployment, Das shows that the constrained optimal allocation of capital does not necessarily require a greater fraction of investment allocated to the urban sector than would the golden rule, since rural investments also help to limit migration. Jha and Lachler (1981) design an optimal vector of linear taxes on urban wages, on capital income and income from land, subject to a social welfare function in the steady state. In this model, government also controls the allocation of capital between the two sectors, and one of the chief results is that optimal investment per unit of labor is higher in the rural sector than in town. In part, however, it seems this result is driven by the inclusion of the gap between rural and urban income as an argument in the social welfare function.

Bartlett (1983) also considers a two-sector growth model, but examines the consequences of adopting the Todaro (1969) variant on the probability of obtaining a job, given by the rate of new job openings (job growth plus turnover) relative to urban unemployment (see Eq. (1) and Blomqvist (1978)). Bartlett shows that the steady-state equilibrium indeed exhibits positive unemployment despite job growth. However this equilibrium is generally unstable: a small drop in urban job creation tends to diminish

urban migration, *ceteris paribus*; but the resulting downward pressure on rural wages is shown to more than offset this effect, resulting in a greater rise in migration than in urban job creation and hence exploding levels of unemployment.⁴⁸ Day et al. (1987) consider the possibility that such instability may offer a further explanation for return migration flows.

3.4. *Effects of migration upon income distribution*

This section is organized according to two measures of inequality adopted in the literature.⁴⁹ The first recognizes three groups – migrants, stayers, and the indigenous population at destination – and considers the effects of rural–urban migration upon average wages or incomes of these three. The second set of measures considered in the literature is concerned with the size distribution of income, and notably measures of poverty and inequality within the rural sector.

3.4.1. *Mean incomes of movers, stayers and destination population*

As a reference point consider a very simple model with two homogeneous factors, labor and capital, producing a rural good and an urban good under constant returns to scale. Capital is immobile between sectors, and commodity prices are determined on the world market for this small open economy. Local labor markets are competitive, but initial wages are higher in the urban than in the rural sector.⁵⁰ Fully informed migrants presumably gain by moving to town. Under these conditions, the consequent withdrawal of labor from the rural sector and the increased supply of labor to the urban sector tend to close the wage gap between town and countryside. Migrants and rural stayers gain, initially better off urbanites lose.

These clear-cut predictions are quite sensitive to the assumptions on which they are founded. For instance, suppose that the rural sector produces more than one good (either two crops or a single crop with rural manufacturing will suffice). The Rybczinski theorem states that, given the assumptions listed above, in the long run, no change in real wage occurs as a result of the change in endowment of labor caused by out-migration: as labor leaves, the rural sector shifts mix of production away from labor-intensive activities (Johnson, 1967). The converse shift occurs in town and together these shifts may remove (or at least diminish) the tendency for migration to close an initial wage gap.

Returning to models with one good per sector, consider the implications of recognizing labor heterogeneity. Suppose skilled migrants move to town. Whether the wage

⁴⁸ See also Neary (1981) and Amano (1983).

⁴⁹ For a discussion of the connections between migration and class, see Keyfitz (1982).

⁵⁰ Factor price equalization through trade is prevented by complete product specialization.

of unskilled migrants is thereby raised or lowered depends upon whether skilled and unskilled workers are complements or substitutes. Thus the consequences for those left behind depend upon their skill mix, the skills of migrants, and the state of technology. Stayers' wages may either be lowered or raised by emigration, even though migration tends to close the wage gap for the migrating skill group.

Labor earnings are only one component in income. In a one-good, two-factor context, the departure of workers lowers the returns to sector-specific capital. The direction of this effect is less obvious in a three-factor model: the effects upon the returns to capital may depend upon the skill mix of movers (McCulloch and Yellen, 1976). Migrants may also transfer some capital with them, or alternatively may invest in the rural sector even after departure (Berry and Soligo, 1969). Indeed, a family with migrants in town may well be induced to invest, either in physical capital or in riskier technologies, even if the migrant does not actually remit for investment (Stark, 1980a). Thus, the effect of migrant departure on both the return to and the amount of capital in the rural sector depend upon the circumstances. Similarly, there may be a net flow of remittances either to rural stayers or to migrants, though in fact either group can benefit from remittances at key times without being a net recipient on average.

So far, it has been assumed that all goods are traded. The addition of nontraded goods (or domestic goods which are imperfect substitutes for foreign goods – the Armington assumption) renders some commodity prices endogenous to the migration process, affected both by shifts in the mix of commodities supplied and changes in consumer incomes. To the extent that rural and urban dwellers consume different bundles of goods, these endogenous changes in consumer prices alter the real mean incomes of these groups.

Although this sketches only some of the elements of the story (the myriad permutations of less than perfect labor markets are omitted, for instance), it should suffice to indicate that the direction of effect of migration on mean real wages and incomes of both stayers and urbanites is ambiguous. If theory is ambiguous in its predictions, what does the evidence show?

At least three branches of the literature address empirical aspects of the effects of migration on mean incomes: estimates of wage gains to migrants, evidence on the effects of migration on average wages at origin and destination, and CGE models permitting simulation of the general equilibrium consequences of migration.⁵¹

Estimating wage gains to migrants. As already pointed out, wages received by migrants prior to moving can only be recorded through panel tracer studies (which are both expensive and difficult) or through recall (which may be unreliable). In the absence of such data, estimation of the incremental wage resulting from migration re-

⁵¹ A related literature addresses the issue as to whether regional income disparities widen or narrow as development proceeds. See Williamson (1965) and Gilbert and Goodman (1976).

quires imputation of the unknown wage prior to moving. Four broad approaches to imputation of the wage gain may be identified in the LDC literature.

One approach is to estimate an earnings equation pooling observations on rural stayers and on migrants, and test whether a dummy for migrants has a positive effect. Using this approach Yap (1976), for instance, estimates a 51% gain in average monthly income for migrants from rural Northeast Brazil, who have been in urban areas of Brazil less than four years, and an even larger gain for those living longer in town. Yap also reports no significant gain in average monthly income for rural-rural migrants.⁵² This simple approach imposes an assumption that it is appropriate to pool movers and stayers – that the returns to education and other estimated coefficients are identical in town and countryside. There is also the difficulty that the migration dummy may be correlated with unobserved attributes which distinguish movers from stayers.

A second approach recognizes these last two difficulties. Separate earnings equations are estimated for various locations, allowing for sample censoring, as a result of location choice. The approach of Falaris (1987) has already been discussed in connection with micro estimates of the decision to migrate. To recapitulate, Falaris finds significant positive selection in six of the 17 earnings equations estimated for the states of Venezuela – workers in these six states receive higher earnings than would observationally equivalent people drawn at random from the population. Pessino (1991) is able to take this a step further, since her data for Peru indicate both current and last place of residence. In particular, Pessino allows different parameters in the earnings equations of movers and stayers, in Lima, other urban areas, and rural areas of Peru, while making sample selection adjustment for censoring on migrant status.⁵³ Among the rural stayers Pessino again finds significant selection, but in this case it is negative – rural stayers earn less than observationally equivalent movers would have earned had they stayed. The converse holds for stayers in Lima, perhaps partly reflecting a discouraged migrant phenomenon. Pessino imposes no cross-equation constraints on the sample selection effects, and finds no statistically significant selection among the migrants.

A third approach uses non-tracer panel data. The Living Standard Survey for Cote d'Ivoire includes a sample of persons working in rural areas in 1985 but who had migrated by the 1986 survey round. In these data Vijverberg (1989) finds an observed wage of migrants, prior to migrating, higher than that predicted from an estimated

⁵² Ward and Sanders (1980) conclude that urban migrants in Ceara state in Northeast Brazil are worse off than if they had not migrated. However these results are difficult to interpret since the urban sample is truncated to include only the poor, whereas the rural sample is not.

⁵³ DaVanzo and Hosek (1981) estimate a closely related switching model using panel data in the US, and compare these results to those derived from the approach described in the previous paragraph – incorporating a migrant dummy in pooled estimates. DaVanzo and Hosek find that their switching model gives implausibly large estimates of the gains to migration and the authors consequently express doubts about the reliability of the switching approach.

wage equation, and conversely an observed wage for stayers which is lower than predicted, and Vijverberg concludes there is consequently positive selection.⁵⁴

In contrast to simply including a dummy for migrants in an earnings equation, the latter two approaches permit the extent of wage gain to vary according to both measured attributes of migrants and according to unobserved effects. The few results available suggest that selection effects do matter, both in obtaining unbiased estimates of the effects of measured attributes (though the extent of bias is not explored) and in the unobserved effects (which vary in sign between studies). A fourth, fixed-effects approach bypasses some of the issues arising from unobserved differences when comparing wages of separate individuals in alternative locations. The first round of the Malaysian Family Life Survey reports earnings of household members recalled over the interval of a decade. Trzcinski and Randolph (1991) use this information to estimate a multinomial logit model of upward, downward and no relative earnings mobility, though the results prove difficult to interpret. Trzcinski and Randolph find no significant upward mobility in relative earnings as a direct result of rural–urban migration. On the other hand, they do find significant downward mobility as a result of urban–rural movement. Complicating the interpretation of both of these effects is the inclusion of a dummy variable for change of occupation which increases both the chance of upward and downward mobility significantly. As the authors note, presumably most rural–urban and urban–rural migrants change occupation, but the estimated model does not include an interaction term between job change and migration status so it is difficult to disentangle the separate effects. Whether the significant downward movement in relative earnings with rural–urban migration results, for instance, from retirement of target savers to their home village also cannot be discerned, for it is not clear how many are returning nor is an interaction with age included in the model.

No matter which of these four approaches is adopted, a number of difficulties certainly remain. Data problems include the major difficulties in measuring earnings, particularly in rural areas and urban informal markets in LDCs as discussed in an earlier section, and the index number problems inherent in measuring cost-of-living differences. There are also other sources of sample censoring. Only those people observed to be earning are included, yet correction for this is not always made even in the recent contributions. Perhaps most important of all, no correction is made for return migration: though understandable given data limitations, this may prove a serious source of bias. Migrants with the lowest gains (having proved unlucky in the urban job lottery, ill informed about opportunities, or whose gains evaporate upon complete information revelation and their subsequent removal from the “averaging pool”) may be censored from the migrant sample by virtue of having returned.

⁵⁴ From the standard errors reported in Vijverberg (1989: Table 1), it seems these differences are not, however, statistically significant. Moreover, it is surprising to note from Vijverberg's data that both observed and predicted wages of stayers are higher than for migrants, indicating that the more productive workers, as measured by observed personal characteristics, apparently remain at home in this context.

The effect of migration on origin and destination wages. In a number of contexts, the effects of inter-regional migration upon average wages, expected wages, or incomes at origin and destination are explored using time-series data. The results are mixed.

Greenwood et al. (1981) estimate a simultaneous structural model of inter-state migration in Mexico from 1960 to 1970, using three-stage least squares. In the equation for change of earnings, the rate of in-migration proves to have a statistically significant, positive effect, while out-migration has no effect. The positive effect of in-migration upon wages, Greenwood et al. attribute to enhanced demand for local (nontraded) goods dominating the effects of increased labor supply, but the data do not permit this plausible argument to be tested. Garcia-Ferrer (1980) reports similar results for inter-provincial migration in Spain, though in this case the dependent variable is change in income and out-migration is also estimated to lower income growth significantly. Salvatore (1980) estimates a structural model of South–North migration in Italy from 1952 to 1976. In this model, migration helps to close the regional gap in unemployment rates through its effect on labor force growth, and the wage differential is also closed indirectly by migration through the pressure of reduced differences in unemployment. Lucas (1987) estimates a model of inter-regional migration within southern Africa, from 1946 through 1978, and finds that migration to South Africa's mines significantly increased estate wages in both Mozambique and Malawi (leading to political pressure to curtail migration from Malawi).

All of these studies suffer from a common problem, inherent in the data. Suppose that a high wage recipient leaves. It is quite possible that the average wage falls, even though wages of each remaining person rises. The population for which average earnings are reported shifts over time as migration proceeds. Whether this leads to over- or underestimates of the change in wages for stayers, depends upon whether migrants receive below or above average initial pay. Not much can be done about this when only aggregate data are available, and cross-sectional micro data do not permit exploration of wage changes, though panel data could be used to explore this effect.

CGE models. Spatial CGE models can be used to simulate the general equilibrium effects of migration (or exogenous parameters causing migration) upon incomes of various household categories. The results are, of course, entirely driven by the construction of the model. For instance, Becker et al. (1986) assume an exogenous rural–urban wage gap, irrespective of migration in India. Combined with an assumption of zero unemployment, this means that the gap between urban and rural employment income per capita is fixed. Adelman and Robinson (1978) also allow for no unemployment in their model of Korea, but allow wage differentials to vary. In this latter model, migration has a major effect in reducing the income differential between town and countryside, in part because migration improves the terms of trade in favor of agriculture. In turn, the increased relative price of agricultural goods stems from assumptions (a) that imported food is not a perfect substitute for domestically produced food (b) that the effect of reduced output of food, resulting from departure of rural

labor, outweighs reductions in demand for food, given consumption patterns of urban workers.

3.4.2. *Inequality within the rural sector*

A number of critics of the rural–urban migration transformation assert that departure increases rural poverty and sharpens income disparities within the rural sector. “Migration proceeds out of inequality and further establishes this inequality”.⁵⁵ On the other hand, the Adelman and Robinson (1978) CGE model for Korea, for instance, depicts rural–urban migration as a major equalizer both overall and within the rural sector. A number of elements may be distinguished in this general debate.

An important component is the income classes from which migrants originate. As noted already, there is some evidence both from village studies (Connell et al., 1976) and from econometric estimates (Banerjee and Kanbur, 1981) to indicate a non-monotonic relationship between propensity to migrate and income – albeit with conflicting results on the signs of the quadratic form. On the other hand, Adelman and Robinson assume migration occurs only from the landless, smallest and small land-owning families: members of medium and high income farming families are taken not to migrate at all. Presumably this has a major effect on the Adelman–Robinson simulated reductions in rural inequality.

A second component is the selectivity in migrant streams. Hance writes:

... there can be little doubt that migration does have the effect of draining away from the rural areas, either temporarily or permanently, some of the strongest, most able, most energetic young men. (Hance, 1970: p. 196.)

The point seems well established, at least in the sense of higher out-migration propensities of the young and the better educated. Whether it is true with respect to unobservable characteristics is less clear, as discussed here in the context of estimating gains to migrants. Yet, assuming that the general point is correct, it does not automatically follow that departure of the “strongest, most able, most energetic young men” necessarily lowers the productivity and earnings of those left behind (Lipton, 1980).

A third, potentially major factor is the role of remittances. Lipton (1980) draws upon an extensive set of village studies to argue that:

- Net remittances from town to village are small.
- Wealthy rural families are better able to educate their children who then migrate and remit.
- Wealthy rural families are able to finance more distant (particularly international) migration which is more lucrative.
- The children of the wealthy are more likely to retain their rural ties and to remit.

Stark et al. (1986, 1988) take issue with Lipton. They develop a method for examining

⁵⁵ Connell (1981: p. 254). See also Lipton (1980) and Schuh (1982).

the impact of remittances on the Gini coefficient of income distribution and examine evidence with respect to this from two villages in Mexico. The overall result is that remittances reduce village inequality in this context. However there are contrasting effects of internal and international migration. Internal migration, within Mexico, from one of the two villages generates remittances which increase the Gini coefficient, in large part because of the high returns to education of the wealthy internal migrants. From this same village there is a long history of migration to the US and here remittances from the US prove equalizing. From the other village, where less international migration occurs, remittances from internal migrants prove equalizing, though remittances from the US serve to sharpen inequality. In other words, as more families have members who migrate either internally or internationally, the remittances from this respective direction of migration help to diminish inequality.

The results of Stark et al. underscore the complexity of effects to be anticipated when examining the impact of remittances on rural income inequality. Allowing for induced changes in other income sources would complicate this picture further. In the end, there seems little reason to presume a universal pattern will emerge. The effects of rural–urban migration upon rural inequality probably are quite varied.

4. Policy issues and options

There are few economic policy instruments which do not affect, or whose efficacy is not altered, by migration. In order to keep the discussion tractable, this section therefore focusses upon classes of policies intended to act fairly directly upon internal migration. Most of these policies are aimed at reducing rural–urban migration. It should be emphasized at the outset of this section on policy issues, that this may not be desirable, for there are many reasons to believe that migration – including rural–urban migration – may prove socially beneficial.

The section begins with a review of experience with direct controls upon mobility before turning to incentives. Sections 4.2 and 4.3 address policies affecting urban pay and rural development (including rural settlement schemes) respectively. Section 4.4 outlines some issues arising from attempts to influence the spatial dispersion of industry, including the role of agglomeration economies. Section 4.5 then turns to the related issue of the interaction between migration and the spatial distribution of investments in infrastructure and other public programs, while discussion of the nature and dispersion of education is treated separately in Section 4.6. Finally, Section 4.7 turns to a brief deliberation on the role of migration in structural adjustment programs.

4.1. Direct controls on mobility

Many municipal governments in developing countries at first reacted to increased migration as if it were an invasion to repel (Simmons, 1981: p. 89).

In a few contexts, authorities have resorted to direct controls upon mobility, requiring permits for transport, settlement or acceptance of a job (see Simmons, 1981; Oberai, 1983). How effective such policies prove to be depends critically upon the ability and willingness of the state to enforce controls, as well as upon the real interest of the state in implementing such a policy. Certainly, the potential for rural–urban migration to enhance urban profits may result in political pressure from the capitalist class not to limit migration; this theme is developed in Stark (1980b).

In Jakarta in 1970, migrants were required to register and deposit their return fare, but vagrants and unlicensed hawkers who were transported out of the city soon reappeared (Simmons, 1981). This was true also of forced slum clearance in Delhi during the emergency declared by Mrs. Gandhi. In South Africa, job permits, settlement restrictions and curfews, have been used in attempts to restrict movement of the black population into designated white areas. Despite the willingness of the South African government and police to use extreme measures, including destruction of unapproved housing and forcible relocation to the “homelands”, some migration has persisted even in this context. Communist China has required removal certificates from place of origin, documentation of job offers, check points on the transport systems, and forced rustication. “...During the period from 1969–73, between 10 and 15 million urban secondary school leavers were resettled in rural areas”.⁵⁶ Li (1989) describes the compulsory relocation that occurred to the Northern Provinces of China, partly for security reasons, but also observes that even in this context there was some return migration – both legal and illegal. As Oberai notes:

However, many researchers have observed that the Chinese programmes were remarkably successful in transferring population to the rural areas.... This may have helped the authorities to check problems of urban unemployment and poverty ... but if so it was largely accomplished by instituting laws and administrative procedures that restrict freedom of movement to a degree unknown in most other nations. (Oberai, 1983: p. 12.)⁵⁷

Thus, direct restrictions upon mobility either prove ineffective or require Draconian enforcement measures, incurring a cost in civil liberties most nations are fortunately unwilling to tolerate.

⁵⁶ Oberai (1983: p. 12). Forced rustication also occurred on a massive scale in Cambodia under the Khmer Rouge.

⁵⁷ Goldstein (1990) disagrees with this perception of success in the Chinese context. He argues that it is erroneous to conclude that “... the Chinese have found a way to achieve high levels of urbanization while also controlling migration to urban areas and rapid urban growth” (Goldstein, 1990: p. 698). Rather, Goldstein depicts a scenario in which improvements in transport and communication have extended the urban hinterland in China.

4.2. Influencing urban pay and labor costs

There is a good deal of evidence to suggest that higher urban earnings act as a significant attraction to migrants. The most effective mechanisms for affecting take-home pay depend upon the source of any downward wage rigidity. Reducing the real minimum wage or public sector pay, in any context, normally proves politically difficult, though failing to increase nominal levels in the face of inflation may be easier. Moreover, showing wage restraint under conditionality imposed by multilateral lenders can permit shifting of some political blame. On the other hand, it is not obvious how often minimum wage laws are the major force in preventing wage flexibility: enforcement is far from uniform and, as Henderson (1986) notes, to the extent that urban migration is biased toward skilled workers, the minimum wage may not be binding on migrants. Where collective bargaining is the major source of the rural-urban wage gap, regulating the collective bargaining process may prove effective in restraining urban wage pressures. Certainly several developing countries have acted to restrain union formation and collective bargaining, though concerns for induced migration are probably not the main root cause for these restraints. A third alternative is an income tax on urban wage income, though evasion and informal sector non-wage employment impose limits on the potential of this as an instrument.

Subsidies to promote urban employment are common in the developing countries.

Slowly the attitude towards migrant squatters and slum dwellers in many developing countries, particularly in Asia, is changing from a punitive to a more tolerant one. A number of measures have now been taken to accommodate migrants in urban areas and promote their welfare.... In order to provide employment, governments have introduced urban public works programmes, promoted the expansion of the construction industry, and legislated on small-scale enterprises. Instead of discouraging hawkers, vendors and family enterprises, many countries have provided them with various types of assistance. (Oberai, 1983: p. 23.)

To this list should be added the common practice of over-staffing in the public enterprises and civil service. Thus, payment of overt wage subsidies is rare, in part because of the difficulties in financing and administering these as already discussed. Rather, subsidies are more typically offered to promote production in certain labor-intensive activities or to promote investment (through cheap loans, diminished collateral requirements, or accelerated depreciation) in such activities (offset by induced adoption of more capital intensive techniques). An alternative to subsidies is a reduction in payroll taxes, such as social security contributions often imposed on the organized urban sector alone, though again this raises a major issue of revenue.⁵⁸

⁵⁸ Other forms of labor market regulation may act very much like wage taxes though without generating any revenue. For instance, several developing countries require government permission to retrench workers, resulting in a diminished willingness to hire. See Fallon and Lucas (1991, 1993).

From the discussion in Section 3.2 it should be clear that the problem of financing such subsidies or tax cuts is not their only drawback. Enacted in isolation, these well-meant attempts to promote urban employment can readily exhibit detrimental side effects – potentially reducing total production and exacerbating urban unemployment.

4.3. *Rural development*

The message that promoting rural employment opportunities can play a key role in stemming the rate of rural–urban migration now seems widely accepted. However, for such policies to succeed they must be sensitive to the underlying causes of migration. Thus, expanding the number of vulnerable jobs may achieve less than reducing the vulnerability of existing jobs. Consequently, acting upon appropriate rural employment strategies proves difficult in practice.

4.3.1. *Intent versus reality in rural development*

Findley (1981) distinguishes two sets of characteristics of rural development strategies. The first set includes several elements which often prove to reduce the demand for agricultural laborers: subsidized mechanization, research and development in labor displacing crop types⁵⁹, pricing policies favoring cash crops and commercial farming, and irrigation schemes which favor larger farmers (whose increased output may depress prices for smallholders). Indeed, irrigation schemes more generally can increase the demand for hours of work and permanent labor, yet diminish the total number of agricultural laborers employed. Findley proceeds to describe a number of contexts in which attempts to promote rural development by strategies exhibiting some of these elements have resulted in accelerated out-migration either to town or to other rural areas.

On the other hand, the intent of integrated rural development schemes, Findley argues, is to focus upon employment creation and human resources more generally. However, even the evidence on the effect of integrated rural development schemes upon out-migration is mixed. A number of the elements in such integrated schemes – such as improved transport and rural schooling to be discussed later in this section – can act to promote migration.

A common component in integrated rural development schemes is a rural works program. Narayana et al. (1988), in a CGE simulation for India, find that a rural works program to build productive rural infrastructure in the off-season can be very effective in reducing rural poverty, if “carried out efficiently, targeted effectively and financed

⁵⁹ See Becker et al. (1986) for a CGE simulation of the migration consequences of labor saving technical progress during the green revolution in India. Yet precisely which aspects of the green revolution were labor displacing and which employment enhancing is still disputed.

in a way that does not jeopardize long-term growth” (Narayana et al., 1988: p. 131). These latter qualifications are far from trivial.

The benefits to rural development schemes – whether integrated or otherwise – ought not to be judged solely by their effects upon rural out-migration. It has also become apparent from widespread experience that rural development, even if it serves to augment rural employment and incomes, may fail to stem the flow of rural–urban migration. Some reasons ought to be apparent from the foregoing discussion in this chapter. For instance, a rise in rural incomes may principally serve to finance more migration. A rise in rural mean income accompanied by greater risk can also accelerate rural out-migration, both because the rural income stream may look less attractive to risk averse households and because of the desire to purchase insurance by placing members in town. A rise in rural mean income accompanied by a more unequal distribution of income increases relative deprivation which once again can serve to accelerate migration.

An understanding of how any given rural development package will affect out-migration requires both a good sense of the motives underlying family migration decisions and of precisely how these components are likely to be altered by the proposed strategy. Various packages affect employment, incomes (both absolute and relative) and the risks associated with these in very different ways. The consequences for migration decisions of changes in levels and riskiness of incomes and employment are unlikely to be uniform across families, irrespective of family size, composition, endowments of physical and human capital, and contextual setting (Peek and Standing, 1979).

4.3.2. Rural settlement schemes

Rural settlement schemes, involving the establishment of new or much expanded farming communities, exist in a wide range of developing countries.⁶⁰ The objectives of such programs are often multidimensional, perhaps aiming to enhance incomes of the chosen settlers, to promote regional development for defense or strategic purposes, to diminish population pressure either in areas of settlers’ origin or of their alternative migration choices, or to remove political dissidents to remote locations. As a result an appropriate criterion for evaluating success is not always apparent (Bahrin, 1981).

Nonetheless, there is some agreement that most programs prove extremely expensive for each person settled. Not surprisingly, Bahrin (1981) identifies selection of site, selection of settlers, magnitude of investment and quality of management as key elements in whether settlement schemes prove productive. Even when schemes offer

⁶⁰ For general reviews see Peek and Standing (1979), Bahrin (1981) and Oberai (1988). On the FELDA schemes in Malaysia see Chan (1981); James (1983) and James and Roumasset (1984) examine the pioneer settler schemes in the Philippines; and Gillespie (1983) looks at the effect of Paraguay’s farm colony promotion on urbanization.

settlers higher than average incomes, the extent of income gain remains unclear, for at least in some contexts initial settlers are not chosen from the rural poor (James and Roumasset, 1984; Lucas and Verry, 1990). Thus James (1983) notes that income generated, for a given investment, is far higher on privately financed settlement schemes in the Philippines, but this is largely because the publicly financed schemes are settled by families with lower initial assets and skills. Moreover, even if initial settlers gain, there is some evidence to suggest that the children of settlers fair less well (Chan, 1981) as do any second-wave settlers (James and Roumasset, 1984).

4.4. *On industrial location*

Almost all developing countries adopt policies intended to influence the location of industrial production. Again the objectives of this can be multidimensional, but often an intent to relocate production rather than labor is a key component.

To the extent that agglomeration production economies exist, internal to a given location but external to the firm, too little rather than too much concentration of industrial production tends to result from private decisions of firms. Each firm fails to take account of external benefits to other producers in their location decision. The evidence on the extent and nature of such agglomeration externalities in developing countries is exceedingly thin (see, however, Shukla, 1984). Wheaton and Shishido (1981) examine cross-country patterns in city population concentration (measured by the square of city relative to total population) against non-agricultural GNP per capita (interpreted as a proxy for market size). They find that concentration at first rises then declines as income rises. It is very difficult to interpret these results in terms of agglomeration externalities: actual concentration surely fails to optimize with respect to these effects at every level of development; moreover, whether per capita or absolute incomes should be used as proxies for market size, and indeed whether the domestic market alone is relevant to the more open economies, may be disputed. Henderson (1986) presents more direct evidence by estimating cost functions for several manufacturing industries in Brazil. Henderson finds that costs decline with the level of employment in the same industry in the same location, but do not decline with local population: this suggests that economies are driven by within-industry production externalities rather than by size of local market or other benefits of urban size.⁶¹

Shukla and Stark (1985, 1990) undertake a ranking of optimally applied policy instruments when agglomeration production externalities exist. The first paper considers a model with two factors of production but with external benefits driven by the level of employment alone. In the context of a log-linear production function, Shukla and Stark demonstrate that an optimal production subsidy is more expensive to finance

⁶¹ Henderson also finds that economies of scale are biased against low-skill workers, offering a partial explanation for relatively high demand for skilled workers in areas of industrial concentration.

than either a capital or labor subsidy, presumably because the external benefit is factor rather than output driven. More surprisingly, numerical simulations suggest that a capital subsidy is cheaper than an employment subsidy, despite modelling the externality as driven by employment, though this may reflect the higher total cost of the optimal employment subsidy resulting precisely from the need to raise employment levels to take advantage of the externality. The second paper, Shukla and Stark (1990), simplifies to one factor of production, but adds the complication of urban unemployment and migration according to the static Harris–Todaro expected wage rule. Simulations in this context show that, for plausible parameter values, the cost of a wage subsidy package is lower if optimally designed to take account of known urban agglomeration economies, rather than applying a uniform subsidy to both urban and rural areas.

Even if other elements dictate wider dispersal of industrial production – perhaps considerations of external diseconomies of overcrowding, or of regional development for strategic reasons – any agglomeration economies call for some concentration (Linn, 1982). Accordingly, industrial location policies frequently focus upon the development of select growth centers.⁶² Hansen (1981) argues that by the 1970s the experience of the 1950s and 1960s led to considerable pessimism with the potential for select growth center development. Hansen maintains that the cumulative failure of these experiences is one of application rather than of principle, a result of political pressures dominating economic considerations, but the failures are no less real for this.

The basis for Hansen's expression of pessimism is not obvious. As Modi (1982) notes, there has been almost no systematic analysis of the cost–benefit ratios of the widespread and continuing use of incentives to affect industrial dispersal in the LDCs. Both Modi (1982) and Murray (1988) describe the range of financial policy instruments deployed in these attempts, including direct relocation assistance, investment tax credits, income and property tax exemptions, and loan guarantees for construction and housing. As Modi (1982) notes, many of these options favor capital and indeed overt employment subsidies do not appear to be common, but this may not be inappropriate in the light of the ranking in Shukla and Stark (1985). Murray parametrizes restricted cost functions for Korean manufacturing and uses these to simulate which instruments are likely to be more effective in lowering costs and hence redirect location decisions. Murray concludes that credit guarantee schemes are very cost effective. However, this conclusion is derived in a context in which access to credit is argued to be a major constraint on small and medium sized firms, with no allowance for the costs of default. Moreover, no explicit account is taken of agglomeration economies nor of any factor bias inherent in these. Nonetheless, Murray's contribution is to be

⁶² See, however, Hackenberg (1980) on the penetration of rural areas by urban-like forms of production and infrastructure.

lauded as representing one of the few systematic empirical contributions in this sorely neglected field.⁶³

4.5. Investing in infrastructure

The location of infrastructure may affect migration patterns both indirectly and directly. For instance, besides using financial instruments to promote select growth centers, many LDCs also attempt to influence the distribution of production activities through investments in infrastructure. The distribution of infrastructure whose output is directly consumed – water supply, electricity, health care, schooling, transport, etc. – may also shape decisions with respect to place of residence (Mills and Becker, 1986). Yet there exists surprisingly little evidence on either count.

The effects of improved rural transportation seem to have attracted the most attention. Whether easier and cheaper transportation between town and countryside promotes or diminishes outward movement is not obvious (Connell et al., 1976). Improved transport permits easier marketing of products in town but also heightens competition from goods imported from town: the effects on relative prices of local goods, whether this favors more labor-intensive activities, and hence the consequences for rural employment are therefore ambiguous. Moreover, better transportation diminishes the cost of an initial move to town and of subsequent visits home, thus encouraging outward movement; but better transportation also enhances the potential for commuting and access to urban facilities for village dwellers. Improved rural transportation facilities may also facilitate movements of labor within the rural sector which in turn can affect rural–urban movements in a number of ways: cheaper (or easier) movement of labor from village i to village j may encourage greater movement to town from j ; ability to move labor between rural locations at non-synchronous peak demands can leave the rural area more responsive to vagaries that do not co-vary strongly across villages, thus substituting for rural–urban migration for insurance purposes; and improved intra-rural transport can enhance the returns on rural capital (notably on trucks or other vehicles), perhaps encouraging rural–urban migration for capital accumulation.

Not surprisingly the evidence on the migration consequences of improved rural transportation is mixed. Findley (1981) summarizes much of the LDC case study material and concludes that extending rural road networks tends to increase departure in the short run but deter out-migration in the longer run through enhanced commuting and local development. Hugo (1981b) examines the case study materials for Indonesia and concludes that improved road transport has probably increased the extent of population mobility, though it may have enhanced circular migration while discouraging long-distance, more permanent moves. Udall (1981) estimates the reduced form of

⁶³ See, however, Tolley and Thomas (1987).

a two-equation model with number of family members migrating and family consumption as dependent variables, using Colombian household data. Included in the explanatory variables are both distance to town and a measure of frequency of bus service. Udall finds that out-migration increases with distance to town and with frequency of bus service, but an interaction effect between the two proves negative. The combined effect is such that increasing bus service enhances migration to town from nearby villages but discourages movement from more remote areas, though one can only speculate on the underlying causes of this observed pattern.

The interaction between the housing market and migration decisions remains comparatively neglected, at least in the developing countries. In the transition economies of central Europe, this interaction is proving problematic. Given the frequent absence of private property rights to housing combined with almost no mortgage financing, the housing market is extremely thin. This is rendering relocation of workers even more difficult during anticipated major structural adjustments. Either a rental or selling housing market must deepen, commuting increase, or location of jobs will be an important component in restructuring and in the definition of comparative cost advantage (Lee et al., 1992). Richardson (1987) includes the incremental capital cost of urban housing in a cost analysis of LDC urbanization. Housing costs should, however, only be viewed as part of the shadow cost of urban job creation if the two projects – job creation and additional housing – are considered totally inextricable, and then the joint output must be included on the benefit side.

One of the most interesting, recent analyses of the interaction between migration and infrastructure in a developing country context is that of Rosenzweig and Wolpin (1988). The authors point out that in evaluating the benefits to subsidized local public programs, the fact that the composition of the local population may be affected, precisely through the attraction of the subsidy to select migrants, is usually neglected (see also Schultz, 1988). Rosenzweig and Wolpin distinguish between family inputs to human capital generation which exhibit properties of a public good versus expenditures which benefit a specific individual. Programs subsidizing the latter tend to attract families with high propensities to spend on children, but this may be either in the form of higher fertility or of higher expenditures per child. Subsidizing family “public” good inputs also attracts families with high propensities to spend but in this case the benefits are not diluted by larger family size: larger families and those tending to spend more per person are attracted. In the light of this, Rosenzweig and Wolpin look at the effects of a child health care program, from 1968 to 1974, in one village in Candelaria, Colombia, on selectivity of migrants from surrounding villages without a similar program.

...in-migrants were evidently drawn from the low tail of the family size distribution, were of relatively high income and, within income groups, had children whose nutritional status was lower than that of observationally-identical members of the resident population. As a consequence, evaluations of the program inatten-

tive to migration selectivity based on differences in program exposure across children born prior to the program were shown to significantly overestimate the impact of the program. (Rosenzweig and Wolpin, 1988.)

Subsequently, however, Pitt et al. (1992) have shown that government decisions with respect to location of public programs, such as health care and schooling, are also significantly shaped by the composition of the local population. It remains to explore the simultaneity of these two threads, when location of programs is affected by population composition and population composition is affected by program sites through induced migration.

4.6. *The nature and dispersion of education*

Evaluating rural education exhibits similar difficulties. Measuring the returns to rural education among those who elect to remain in the rural areas offers a biased picture in view of the selectivity of out-migration (Schultz, 1988). Indeed, there appears to be such widespread agreement about the incidence of rural education having a major effect on the propensity to migrate, that rural education programs cannot be appropriately evaluated without taking the consequences of induced migration into account.⁶⁴

Yet almost all of the statistical evidence on the effects of rural education upon departure focusses upon quantity rather than quality or content of education, whereas the important decisions at the margin may be investments in upgrading quality (Behrman and Birdsall, 1983). Indeed, partly in response to the induced rural-urban migration, a number of developing countries design rural, vocational curricula in the hope both of raising productivity in agriculture relative to that in town, as well as of changing tastes with regard to rural life. There is some evidence to indicate that even conventional primary schooling does raise productivity in agriculture (Lockheed et al., 1980). Whether rural vocational training enhances this effect is much disputed, and certainly the case study evidence on whether the rural-relevant education diminishes out-migration is mixed (Findley, 1981).

Migration for education, though usually at higher levels of schooling or college, is not uncommon in developing countries. This may either take the form of individual children moving (often to stay with kin), or of families relocating to take advantage of better educational facilities (Henderson, 1986). On the other hand, older children in

⁶⁴ Speare and Harris (1986) note that in Indonesia the much higher rate of rural-urban migration among those with post-primary education is difficult to explain in terms of relative earnings alone. Speare and Harris suggest that this may simply be a reflection of the skill mix of jobs created in town, resulting in migration of the better educated without necessarily raising their rural-urban earnings differential. Alternatively, the non-monetary advantages of urban jobs – both job security and working conditions more generally – may be a source of attraction for the more highly educated.

rural areas may commute substantial distances to attend school, raising difficult empirical issues of appropriately measuring access to schooling facilities.

4.7. *Structural adjustment and development strategies*

Differing levels of effective protection offered to various production activities can have a profound effect upon the spatial distribution of the demand for labor and hence labor migration (Rehnberg, 1977; Kelley and Williamson, 1984). This is true not only of policies affecting the domestic terms of trade between agriculture and industry. Protection offered to mineral extraction or other natural resource based activities also generates location-specific labor demands. Moreover the intensity of agglomeration economies associated with various industries affects the degree of population concentration likely to be induced by any given structure of protection.

Conversely, structural adjustment resulting from an episode of trade liberalization involves some degree of labor migration. Indeed, the speed with which labor migration is induced may be an important component in the speed of structural adjustment, though this is not necessarily an argument for slow reform (Mussa, 1986).

Despite the potential importance of this interaction between structural adjustment and labor migration, little empirical evidence exists on the subject. A few spatial CGE models are used to simulate the consequences for rural–urban migration of changing the terms of trade between agriculture and industry,⁶⁵ though such models are usually not founded upon direct econometric evidence and none adequately incorporates issues of lags in adjustment.

5. **Closing thoughts**

Our ideas and information about internal migration in developing countries have grown substantially in the last decade or so. Yet the dominant policy concern continues to be containment of rural–urban migration. This concern may well be misplaced. The transition to a more highly urban population is not proceeding at a particularly alarming rate. Rather the rapid LDC urban population growth is driven largely by high overall population growth. Moreover, answers to the narrower question as to whether too much labor is being transferred to the urban sector are far from clear-cut. Major elements of urban bias do exist in many contexts, although there has been a heightened awareness of the benefits to some forms of rural development schemes.

⁶⁵ Becker et al. (1986), for instance, simulate the consequences for Indian urban population growth of a shift in the world terms of trade between agriculture and industry. In this context, only a tiny effect is found, though this is largely because India's production decisions were largely insulated from world prices, precisely by her trade protection strategy, at least until very recently.

Despite many claims to the contrary the basic ideas of the Harris–Todaro framework survive in essence if not intact after prolific modifications and some testing. Nonetheless we surely reached rapidly diminishing returns to further modifications to and extensions of the Harris–Todaro model quite some time ago. This is true also of the empirical literature estimating the responsiveness of migration flows to earnings differentials. Despite increasing refinements in estimation techniques, the basic messages seem to remain the same.

On the other hand, our understanding of factors determining the urban component of those earnings differentials remains poor. Efficiency wage stories now dominate the world of theory, but little evidence has been compiled either in favor of or to contradict these ideas. Indeed it is not yet clear how they may be tested even in principle.

In spite of the importance of rural development as a counter force to urban job creation, implementing “appropriate” forms of rural development has proved far more difficult and contentious. We have gained some understanding of the complexity of raising the demand for labor or laborers in agriculture. Yet whether additions to rural incomes discourage or permit more rural–urban migration is not everywhere apparent. The potentially important role of rural risks in promoting migration for insurance is also now recognized, though quite how these risks may effectively be reduced through policy measures is not obvious.

Despite the ubiquitous adoption of policies to promote industrial dispersal, either in select growth centers or, perhaps less often, through “rurbanization”, almost no quantification exists of any net benefits from moving capital rather than people. Even the responsiveness of industry to fiscal incentives to relocate has hardly been touched upon.

The literature on the interconnections between the location and nature of infrastructure and public programs on the one hand and migration on the other hand is only slightly richer. There is very little evidence on the effect of such investments on the decisions of potential migrants to relocate or not. Moreover, the evaluation of such investments may be biased if the consequences of induced migration are ignored.

Indeed in general terms it is probably fair to say that economists have been largely preoccupied with the migration of labor. Movements of families or parts of families to gain access to (better) schooling, health facilities, or other publicly provided services has therefore often been of peripheral concern.

The growing literature on family strategies and migration has more recently widened this circle of reference for economists. The interactions between migration, fertility, marriage, and family structure have begun to be explored. Within other disciplines similar issues were raised at a much earlier stage. Thus far, the contributions by economists in these spheres seem promising. Still, our tests of any resultant hypotheses have normally been conducted in one context at best. Replication or refutation of these ideas in other spheres must be high on our agenda.

Exploration of family risk spreading strategies has led economists to follow some earlier sociologists in rejecting the sharp urban–rural development distinctions of the

early dual growth models. Such evidence as we have suggests that a view of families straddling at least these two sectors is both more accurate and more illuminating.

The bulk of internal migration in the Third World is rural-rural and not rural-urban. Our early focus on dual models blinded economists to the feasible diversification within the rural sector, resulting in almost total neglect of the predominant mode of internal migration. Similarly, though for different reasons, circular and temporary migration have hardly been studied except in the context of micro case studies. Statistical testing of hypotheses on the causes and consequences of this apparently common phenomenon will require more specialized surveys.

Thus, while our ideas and (to a lesser extent) our information about internal migration in the developing countries have been considerably enriched in recent years, a great deal remains to be done. There are major policy areas, touching more or less directly upon migration, where almost no systematic empirical knowledge has yet been amassed.

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