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# INCOME DISTRIBUTION, FERTILITY DECISIONS AND THE SHADOW WAGE RATE : IMPLICATIONS OF A NEW APPROACH TO RURAL-TO- URBAN MIGRATION IN LESS DEVELOPED COUNTRIES

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## INTRODUCTION\*

This paper presents in outline a new approach to the theory of rural-to-urban migration in Less Developed Countries (LDCs). Implications of this approach for inequality in the distribution of income, fertility decisions and the shadow wage rate are explored.

The conventional models of rural-to-urban migration in LDCs abstract from the agricultural characteristics of the absolute majority of families generating rural-to-urban migration. In addition to their failure to incorporate the consideration that migrants are members of farming families, conventional models do not consider families to be the appropriate decision-making units responsible for generating rural-to-urban migration. Rather, migration is seen as a straight forward consequence of individuals' decision to maximize their expected income.

The starting point of this paper is thus the utility maximizing family in its specific agricultural context. One immediate implication is that the migrating agent and the decision making unit no longer need coincide, an attribute which at once complicates and enriches the explanation of the rural-to-urban migration phenomenon.

This paper intends merely to outline the new approach and to illustrate its consequences. Clearly, the validity of any approach is an issue which has to be settled empirically; evidence bearing on the current approach is presented and analyzed elsewhere.<sup>1</sup> One critical link with evidence which is universally valid, e.g. that rural-to-urban migration is selective with respect to age, marital status and education<sup>2</sup> - is that

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1 See Stark (1978), Chapter III.

2 See op. cit., op. cit.

the approach portrayed here offers a new explanation as to why the response to the pressure to migrate comes, for example, from the young, the single and the relatively educated.

#### A. A NEW APPROACH TO RURAL-TO-URBAN MIGRATION — THE FRAMEWORK

During the specific time span of its life cycle relating to the earlier phases of its existence, the "net utility maximizing family unit" (a family enterprise which is an agricultural producer on its own small holding) observes a continuous reduction in its welfare, measured in "net utility" terms. Net utility is defined as the difference between the labour-income utility and the effort-disutility of work. The former is assumed to be monotonically increasing with food but at a decreasing rate; the latter is assumed to be monotonically increasing with labour but at an increasing rate with the production function of food — which depends on labour and technology — being strictly concave. The reduction in net utility is due to two "compositional changes": changes in age structure and in family size. Firstly, given the family size, the change in the family's age structure results in greater food requirements. This in itself raises the marginal utility from food throughout. Secondly, family size itself changes over time as additional children are brought into the world. (At this stage of the argument fertility decisions are assumed exogenous). Since the total utility to be derived by a family unit from any given quantity of food cannot be determined independently of the number of its members and since the appropriate assumption is that the relationship between the two is an inverse one, an increase in family size thus brings about a shift downwards of the utility function. The combined impact of the two compositional changes is thus "a downward projection and twist" — a change in level (intercept) and a change in the rate of change of level (slope). The obvious implication, in a utility-disutility plane, is the achievement of a new "labour equilibrium input" (to the right of the original one) with a lower net utility. An incentive to change production technology is generated, the intensity of which continuously increases. In a utility-labour input plane, the net utility implication of an induced land-augmenting technological change in food production is a shift upwards of the utility corresponding to the production function subjected to the technological change.

However, the change of technology is hindered (a) by the very characteristics of the new technology and (b) by the factors characterizing the institutional and the non-institutional "surplus-risk state" confronting the small farmer's family.

Of the factors characterizing the new technology the more critical ones are its surplus requirement and its (subjective) risk-increasing nature. Both factors are usefully illustrated by the transition from traditional varieties to High Yielding Varieties.<sup>3</sup> As to the characteristics of the "surplus-risk state", the absence of smoothly functioning market structures and appropriate institutional (as well as non-institutional) arrangements (especially credit and insurance arrangements) implies that the internal constraints arising from the prevalence of production risks

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3 For a detailed discussion see Stark (1978), Chapter II.

and aversion to them and low level of (absolute and relative) surplus cannot be alleviated through the (highly fragmented) markets. On the other hand, the small farmer's family possesses no or only insufficient surplus and no capacity for engagement in sufficient self-insurance; with the family initially endowed with the "cruel parameter" of only a small holding, with average capacity to generate surplus being directly proportional to on-the-farm production but inversely proportional to the (standardized) number of family consuming members, the prevailing surplus and the expected surplus are likely to be low.

It is worth pointing out that with surplus insufficiency and risk averseness prevailing simultaneously, the impact exerted jointly by them is greater than "the sum" of the two impacts considered separately. This results from, and implies, prevalence of positive interaction between surplus insufficiency and averseness to risk. On the one hand, the degree of risk aversion is related directly to the degree of surplus insufficiency; larger surplus diminishes the degree of risk aversion paired with a given risky prospect. On the other hand, a higher degree of risk aversion paired with a given risky prospect (i.e. a prospect which requires a given surplus) magnifies the overall surplus requirements since (given the absence assumed throughout of insurance markets) part of the surplus has to be destined as an insurance fund.

The easing of the surplus and risk constraints becomes a critical condition (and indeed, under a fairly general set of postulations, a necessary and sufficient condition) for carrying out the desired technological change. It is rural-to-urban migration of a family member (i.e. a son or a daughter) which, by bypassing the credit and insurance markets that bias against the small farmers, facilitates the change. This migration succeeds in doing, via its dual role in the accumulation of surplus (acting as an intermediate investment<sup>4</sup>) and — through diversification of sources of income — in the control of the level of risk.

It is of both analytical and empirical interest to note that migration's role in the accumulation of surplus is not necessarily directly accomplished by the migrant member in the urban sector. Putting it differently, that surplus-wise migration is pursued because of the positive net effect it bears on the accumulation of surplus need not imply that the whole or even part of the surplus is accumulated in the urban sector. To the extent that, consequent upon migration, some farm produced food which would have had to feed say the maturing son had he stayed on the farm is freed, surplus is accumulated on the farm. One implication of this situation is that net migrant-to-family, urban-to-rural remittances are at best a downward biased estimate of the overall surplus accumulated by the family.

Risk-wise, it can be proved<sup>5</sup> that as a constant risk averse decision maker who confronts a riskier situation, the small farmer will adopt

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4 In-between technological investment which has a certain lumpiness and investment in financial assets which has a low or even negative return.

5 See Stark (1978), Chapter II and Appendix II.

a risk depressing strategy. Given the strategies' space and a general diversification rule in a portfolio selection theory sense, this strategy is allocation of a maturing son's (or daughter's) labour in the urban sector.

Of those points probably left unsettled by this brief outline, reference will be made here to only one — that concerning the selection of the family migrant member.<sup>6</sup> Given the migration strategy, the reason for the particular allocation outlined above, with the maturing son being selected as the migrating member, whilst the head of the family stays behind, lies in comparative advantage considerations and their consequent dictate of specialization. These, in turn, derive from the relationship between the magnitudes of three main variables: efficiency (productivity) in on-the-farm food production; probability of securing urban employment: urban wage rate (in particular, urban income in general) once employment has been secured.

Compared with his maturing son, who either did not participate in agricultural production or did so only for a short period, the head of the family is most probably the better farmer. He is more likely to possess a firm knowledge of husbandry which presumably depends most on both tradition and personal past experience, the first being fully grasped through the latter.<sup>7</sup> His choice of enterprises and practices, timing of operations and general management of farm production can be expected to be nearer to their optimum levels (that is, given the overall set of production constraints).<sup>8</sup>

The reverse seems to hold with regard to production efficiency in the urban sector. More so than any other single characteristic, and particularly as compared with experience in agricultural production, some form of general education (e.g. basic skills of communication and computation, sometimes enriched by some vocational training) is a pre-requisite of the capacity to perform a wide range of urban jobs; it is the maturing son who is more likely to possess a given (or often, any) level of education.

This supply feature, apart from endowing him with a necessary capacity and a higher productivity in the performance of some jobs, also implies that more urban labour markets are accessible to him. Lack of given educational qualifications palpably excludes job seekers from many

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6 Other points e.g. reasons for holding the view that a farm-family will prefer rural-to-urban migration by the eldest son once he gains maturity to the "seasonal rural-to-urban migration" by the head of the family which may have been adopted previously, are dealt with in Stark, op.cit.

7 Embodied in these factors is frequently the only basis for the crucially important capacity of environmental predictions, however limited.

8 Note that, throughout the analysis, the head of the family is taken to be a decision-maker who is both aware of the new technology and strongly desires to adopt it.

skilled labour markets. (Filtering and displacement, if they prevail, are in the downward direction). To the extent that education is a critical determinant of employability, in the demand for labour of many urban industries — either from the point of view of employers because the knowledge embodied in the education of potential employees directly enhances their productivity, or because educational attainment constitutes the best single indicator of the desirable characteristics of potential employees available to employers — the maturing son potentially should be the more successful job seeker. Moreover, it is this factor which is likely to furnish him with more job information (as it is scarce) and better job information (as it is not of a uniform quality).

If education can be used as a satisfactory proxy for "labour quality" (general knowledge, skills, capacity for on-the-job training, initiative, motivation) and if urban wage structure is such that wage differentials are positively and closely associated with labour quality (whether directly or indirectly through the occupational structure of urban wages) then, comparison in terms of the third variable, the urban wage rate, would also favour migration of the maturing son. Imperfections, rigidities and frictions, though weakening this association, are unlikely to nullify it. The migrant labourer who possesses more "human capital" can expect a positive probability of employment in more urban markets where wage levels, as compared with those pertaining in the other markets, are generally higher.

Since, if anything, the three variables are positively correlated, their combined implication would a fortiori be that the maturing son should be selected as the family migrant.

## B. SOME IMPLICATIONS

### 1. The distribution of income by size

To an important extent, evaluation of the impact of rural-to-urban migration on the inequality of the distribution of income by size depends on the choice of the basic income recipient unit. The choice of the basic recipient unit — individual, household or family — depends on the general criteria of choice utilized. To ensure relevancy (and a proper choice in practice) the criterion applied must be sufficiently sensitive to comprehend the type and nature of rural-to-urban migration as analyzed in the foregoing section.

Explicitly and particularly, a critical requirement of an appropriate choice is that it should fully reflect the identity of the decision-making unit with respect to income plans — (long term) income earning as well as income disposition. Being the locus of major decisions on income (including the means of obtaining it — inter alia via rural-to-urban migration of one of its members) the family and not the household (nor, for that matter, the individual) is clearly the relevant income recipient unit; choice of a multiperson urban household (common residence, housekeeping sharing etc.) in which the migrant happens to reside, inappropriately appends the migrant, for example, to a family with whom economic ties are short-term, in whose income decisions he does not really participate and

by whose income decisions he is not really affected. Considerations of a similar nature render it equally inappropriate to refer to the individual rural-to-urban migrant family member as an independent income recipient unit. Although living separately from his family, the migrant's participation in the family's common decisions (which affect him too), his involvement in familial pooling of resources and income (e.g. pooling aimed at facilitating migration, remittances transferred to facilitate the rural end technological change) and the general prevalence of intensive economic ties between himself and his family at least over the medium term, all imply that it makes little sense, analytically, to refer to the migrant as an independent income recipient unit and that in any meaningful evaluation both his and his family's incomes (shares) should be combined.

Within a fairly general, welfare oriented, approach the implication for the analysis which follows is that at least for a considerable period of time, in evaluating the impact of rural-to-urban migration on the distribution of income by size (a) an a priori classification is in order, viz. the criterion for defining income as rural or urban should depend on the recipient's initial location and not his current location nor, for that matter, the locality in which that income has actually been generated; and (b) the income recipient unit to whom incomes are attributed has to be the rural based family inclusive of its "urban extension", namely the migrant member.

Failure to observe these simple implications could produce untenable conclusions. Whereas observing the family as a whole some short while after migration is likely to imply reduction in overall inequality, observing each of its two components separately may imply a widening inequality. Further, whereas looking at the rural family inclusive of its urban member migrant could promptly indicate an improvement in its income position, looking at the rural family independently of its migrant member could (absurdly) indicate deterioration in its income (and welfare) position.<sup>9</sup>

With this preliminary proviso in mind, some general income distributive implications of rural-to-urban migration can be examined.

To start with, it is necessary to intimate that not every transfer of income (existing or incremental) from the relatively rich urban sector to the rural sector is desirable from the point of view of the overall equality in the size distribution of income. It is easy to think of transfers which will increase inequality both within the rural sector and within the economy as a whole (even if intra-urban inequality would not be worsened at the same time). To an important extent, the precise outcome depends on the relative position, in the rural hierarchy, of the transfer recipients (as well, of course, on the size of the transfer itself).

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9 Consider a situation whereby prior to migration the migrant's income and consumption were 100 and 80 units respectively, whereas following migration his income is 200 of which 50 are remitted to his family.

Consider however, the following hypothetical (but not, as far as relative magnitudes are concerned, unrealistic) case: there are four rural families with incomes of 1,3,3,5 units respectively and two urban families with incomes of 4 and 22 respectively. The Gini coefficients for the rural, urban and the total population — rounded to full percentage points — are .25, .35 and .49 respectively. To avoid unnecessary acceptance of the particular social welfare judgement implied in usage of this inequality measure, other measures — the Kuznets index and what could usefully be labelled Theil's entropy index — are also employed.<sup>10</sup> These indices render inequality magnitudes of .22 .69 and .49 and of .17 .46 and .45 respectively. Assume now that rural-to-urban migration from the second (or third) poorest rural family has taken place with a consequent increase in income from 3 to 4 units. Referring to this increase — in accordance with the implications of the foregoing comments — as an increase in that family's income results in the sectoral Gini coefficient remaining unchanged but in the coefficient for the total population registering an improvement (.47 as against .49). Precisely the same result is rendered by the entropy index (i.e. sectoral coefficients unchanged, coefficient for the total population registering an improvement — .43 as against .45). The Kuznets index also registers an improvement for the total population (from .49 to .48). Clearly, this result — concerning the population as a whole — is enough to withstand a change in the sectoral classification of the income recipient unit engaged in migration. For example, it holds irrespective of whether rural-to-urban migration is from or of the second (or third) poorest rural family who may then be re-classified as urban. Not surprisingly, it is even compatible with the extreme case where the definition, sector-wise, of a family depends on its current locus and when the whole family migrates — a case in which (utilizing the Gini index) both the rural and the urban distributions of income become more unequal (.30 as against .25, .40 as against .35 respectively).

Unfortunately, it appears that there are not, to date, any empirical studies which have explicitly and systematically attempted to quantify the dynamic relationship between rural-to-urban migration and changes in the intra-sectoral, inter-sectoral and overall size distribution of income. Therefore, it is useful to make the following, generally valid observations<sup>11</sup> which are utilized to shed some light on the qualitative

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10 The Gini coefficient is the arithmetic average of the absolute values of differences between all pairs of incomes standardized to range between 0 and 1. The Kuznets index is the arithmetic average of absolute deviations of income shares from population shares standardized to range between 0 and 1. The entropy index is based on concepts borrowed from information theory; its presently relevant interpretation is: if  $x_i$  is the income share of the  $i$ -th family  $i = 1, \dots, n$ ,  $\sum x_i \log \frac{1}{x_i}$  measures equality and consequently  $\frac{1}{n-1} [n - \text{antilog } \sum x_i \log \frac{1}{x_i}]$  is a measure of inequality standardized to range between 0 and 1.

11 For references and some evidence see Stark (1978), Chapter IV.

relationship between rural-to-urban migration and the size distribution of income.

Firstly, in most LDCs perhaps two-thirds to three-fourths of the poorest, the bulk of which are small self-employed farmers, are located in the rural sector.

Secondly, in most LDCs, although both intra-urban and intra-rural income distributions by size are largely unequal, the intra-rural income distribution is relatively more equal than the intra-urban income distribution. The main factors which contribute to this relationship are probably: (a) the nature of the production process (lower capital intensity, higher labour intensity in the rural sector); (b) the pattern of the distribution of production resources other than labour. (With the exception of land in some Latin American countries, capital and land are most probably more equally distributed in the rural than in the urban sector); (c) the extent of specialization and diversification (labour differentiation) of the occupational structure. (The scope for specialization and the actual levels of it are higher in the urban sector); (d) the low level of rural incomes in general (lower than the urban level) suggesting a more equal rural than urban distribution of income; (e) wealthier urban persons are less risk averse; to the extent that riskier choices increase inequality, urban inequality would be greater.

Thirdly, rural-to-urban migration is dominated by members of small farmer families (small farmers are taken here to imply, *inter alia*, having access to highly limited productive services) who, income-wise, are concentrated in the middle rather than in any of the extremes of the rural size distribution of income.

These three considerations together render it possible to argue that a transfer of income from a less equal segment of the income distribution — urban, to a lower, more equal segment of the distribution — rural, directed not to the upper group in the latter but to the small farmers is most probably, over-all, equality increasing.

To illustrate, assume first that the urban and the rural distributions are homogeneous, with the urban average being higher than the rural average. Referring to the direct, first round effect, rural-to-urban migration resulting in urban employment shifts the rural unit (inclusive of its migrant member) upwards in the income scale. Assuming no change in the incomes of the urbanites, and utilizing the Gini coefficient which, in such a context, is reduced simply to the difference between the rural population share in the total population and the rural income share in the total income, it unequivocally registers an improvement: the proportion of total income going to the ruralites is greater than before.

Assume now that there are three sectors: rural, urban informal, urban formal where again every unit receives, in its sector, the sector's average income. There is a ranking between these averages such that the rural average is smaller than the urban informal average which, in turn, is smaller than the urban formal average. Assume further that rural-to-urban migration results in employment in the informal sector. Clearly

(and so long as the ordering is preserved and not affected by this migration) with the proportion of income going to the ruralites being greater than before, Gini, too, registers an improvement.

It is interesting to note in this context that it can be shown that in the absence of externalities and returns to scale, any uniform increase in the number of income recipients (that is, over all income groups) will leave the Gini coefficient (and also other indices of inequality based on average income and dispersion of incomes) unchanged.<sup>12</sup> When the populations  $n_1$  and  $n_2$  of the two groups, each homogeneous in its incomes, grow by  $\alpha_1$  and  $\alpha_2$  respectively, where  $\alpha_1$  is greater than  $\alpha_2$  but  $U_1$  is smaller than  $U_2$  —  $U_i$ 's being the average incomes, Gini will register an increase in inequality; however, a transfer of income recipients from the lower income group by a magnitude given by solving

$$\frac{n_1[(1+\alpha_1) - \Delta\alpha_1]}{n_2[(1+\alpha_2) + \Delta\alpha_1]} = \frac{n_1}{n_2} \quad \text{so that the incomes of all those transferred}$$

will be as of the higher income group will result in Gini registering an improvement over the original state. Mere migration from the rural sector resulting in higher incomes for the families engaged in it generates, under conditions reflecting the assumptions made above, a more equal size distribution of income.

The following scenario — to be validated by evidence — is thus suggested: the direct, first round impact of rural-to-urban migration is a distribution equalizing one, when migrants who are members of poor families of a poor sector join a less poor sector and, consequently, they and their families taken together, become less poor.

## 2. Fertility decisions

In section A. it has been assumed that fertility decisions are exogenous. In the present section, the implication of internalizing these decisions is examined.

Within the utility maximization framework generally utilized in studying the determinants of fertility, children are seen (from a private parental point of view) to yield various direct and indirect utilities which may be conveniently enumerated under three headings: consumption utility (children are a source of personal satisfaction and pleasure); income utility (children directly contribute to the family income via their work); status, security and insurance utility. (Status — e.g. when position and power are established through children generated familial ties; security — especially old age security; insurance — an extra child can generate various utilities in the event that other children have failed to do so, mainly because of early mortality).

One implication of the approach outlined in section A. is that a new element is added to the utilities from children vector viz. "overcoming the market segmentation" (through migration) utility. This element

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<sup>12</sup> See Stark (1978), Chapter IV.

is distinct from the other elements, in particular the income utility element, in that children's primary role as migrants is not to generate an income stream per se but to act as catalysts for the generation of such a stream by way of facilitating an income increasing technological change on the family farm.<sup>13</sup>

At the same time it has to be recalled that within the narrower utility maximization framework of section A., and for a certain period, children were seen to depress familial net utility by their mere appearance and growth. The very incentive to incur technological change is attributed to these impacts. In such a narrower utility maximization framework, with the net utility diminution ("disutility"), and the removal of the credit and risk constraints inhibiting technological change ("utility"), as the only "cost" and "benefit" respectively, the bringing of children into the world signals that the marginal cost as yet has not outweighed the future marginal benefit (appropriately discounted) of an additional child. With other elements also present — internalizing the fertility decision renders it necessary to broaden the utility framework— such a paradoxical interpretation is avoided.

The presence of other elements helps to explain the marginal nature of the considerations involved in the "migration utility from children". Given the presence of some children, if for such reasons as skill or sex none is an appropriate candidate for migration, an extra child may be brought into the world and prepared for eventual migration, possibly with other children contributing to this preparation (e.g. financing the future migrant's education) — a necessary intermediate investment.<sup>14</sup>

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<sup>13</sup> Note that this implication (and its consequent fertility implication noted in the text below) is in sharp contrast with the view forcefully expressed by Mueller on a number of occasions e.g. Mueller (December 1975). Her argument is that the advent of the high yielding varieties has enhanced the need for purchased modern inputs rather than the kinds of capital which are essentially an embodiment of household labour. Consequently, it is probably more important for farmers to economize on family expenditures than to have many hands to work. The opportunity cost of supporting children seen then to compete with the externally produced input is thus raised, exerting a downward pressure on fertility.

Obviously, Mueller's failure to incorporate in her analysis migration and its role, the segmented structure of credit and insurance markets and the discrete nature of the technological transformation account for her reaching a diametrically different view than the present one.

<sup>14</sup> Access to some education which to a large extent is financed by governmental subsidies — not by those small farmers whose children are enrolled — is significantly easier and definitely more equal than access to the credit market. Building on the expectation of a high cross rate of return to the joint decisions to educate a maturing son and then "expel" him to the urban sector, migration and the education preceding it substitute thus for the credit deficiency the alleviation of which is mandatory in facilitating the technological change on the family farm. A similar argument holds with respect to the risk constraint impinging on the technological change.

A related reason why the "migration utility" may lead to the production of an extra child stems from considerations of substitution and complementarity and indivisibility. As already indicated, children are the source of a number of different utilities. Yet, especially in the context of a less developed economy, not all children or any one child, can efficiently provide all utilities. Specialization by different children in the production of different utilities increases total utility from children; *inter alia*, this stems from the prevalence of positive interactions. Often, specialization and indivisibility effectively tend to rule out the possibility of the same child providing "supply side" competing utilities. Some examples will serve to illustrate this point.

Rural-to-urban migration by a maturing child presents a risk of severance, by the migrant, of the economic ("instrumental") ties between himself and the head of the family as well as the rest of the family unit. This risk is particularly real if migration results in a remunerative and stable urban job, on completion by the migrant of the "pre-marital adolescence" stage of his life-cycle, and if the migrant remains in the urban sector for a considerable number of years after migration. Precisely at the same point in time, parents requiring "old age security" may find that it is not forthcoming from the migrant child. The task of providing "old age security" would have to be assigned then to another child who may be "less productive" but willing to allocate a larger share of his income to his parents. For example, this may be a child who stays behind in the rural sector and who, together with the head of the family, directly participates in the farm-end technological change facilitated by the other migrant child.

The point to be stressed here is that to the extent that children's capacity to generate different utilities is a planning variable, children will be prepared differentially to these competing tasks. Continuing the example, the potential migrant may be subjected to more or better "urban biased" schooling with the other child, say, engaging intensively in farm production. A recent (1974/1975) survey in Sierra Leone<sup>15</sup> affords an illustration of this: a quarter of all rural-to-urban migrants were youngsters leaving (indeed, sent away) for schooling (the typical educated migrant attends more than half of his school years in an urban area) and another fifth were children sent away for upbringing — indirectly for schooling too. Here, rather than preceding migration, education is interwoven with it (some education precedes migration which, in turn, is followed by more education).

As another example note that the critical importance of children who specialize in the provision of different utilities in actually providing these utilities, intersected with indivisibility, implies a high degree of risk aversion in the number of children — thus favouring a high fertility level.

An important implication stemming from this argument, concerning the relationship between economic policies aimed at reducing fertility

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15 Byerlee, Tommy & Fatoo (1976).

and the determinants of fertility, is that these policies have to take into consideration an additional pro-natalist element. Children are seen to yield an additional benefit viz. removal of the risk and credit constraints inhibiting technological change in the rural sector. Thus, just as a social insurance scheme may be essential in depressing the "provision of old age security motive" for having children, so may an institutional arrangement catering for the supply of credit and the control of the level of risk be required to defuse the "migration motive" for having children.

### 3. The shadow wage rate

In this section it will be shown that (given some simplifying assumptions), incorporation of the approach outlined in section A. into a model representative of the current rural-to-urban migration literature, implies that the market wage rate in the urban sector overestimates the shadow wage rate — henceforth SWR. This result is in contradiction with the result obtained in other studies e.g. Lal (1973), Mazumdar (1976). There, in a similar context, equality between the shadow wage rate and the market wage rate is obtained.

Assume that an extra job is created in a public sector urban industry. The SWR of filling the new job (the accounting price of the respective labour unit) is an opportunity cost depending (a) on the number of labourers drawn from other sectors and the resultant loss of production per labourer there; (b) on the net increase in consumption when the volume of saving in the economy is sub-optimal. Specifically, when one labourer leaves the rural sector where his marginal product in agricultural production is MPL and fills the new urban job receiving wage W,

$$SWR = MPL + c \left[ (W - MPL) - \frac{1}{S} (W - MPL) \right] \quad (1)$$

where  $c$  is the marginal propensity to consume and  $\frac{1}{S}$  is the social value (price) of a unit of consumption in terms of savings ( $1 < S < \infty$ ). The subtraction in the second term is thus necessary as not all the increase in consumption is socially undesirable (that is, being regarded as a social cost). Obviously (1) reduces to

$$SWR = MPL + c \left( 1 - \frac{1}{S} \right) (W - MPL) \quad (2)$$

To facilitate utilization of a comparative static procedure it is assumed that the labour market is initially in equilibrium indicating equality of the expected wage in the urban sector with that in the rural sector.

If  $g$  is the (exogenous) rate of creation of new urban jobs and if  $v$  is the (exogenous) rate of creation of vacancies due to quits and firings then, with complete turnover, the probability of obtaining an urban job is

$$p = \frac{(g + v) N}{L - N} \quad (3)$$

where  $L$  and  $N$  are the total urban labour force and the number of urban jobs or of job holders respectively. Although  $L$  and  $N$  are integers they will subsequently be treated as continuous variables. From (3) given  $p$ ,

$$\frac{dL}{dN} = \frac{g+v}{p} + 1 \quad (4)$$

implying that when one extra urban job is generated ( $dN = 1$  and other things remaining unchanged),  $\frac{g+v}{p} + 1$  rural labourers join the urban labour force. If one of these migrant labourers succeeds in capturing the new job – the other  $\frac{g+v}{v}$  drawn into urban unemployment – the SWR is

$$SWR = MPL\left(\frac{g+v}{p} + 1\right) + c_2\left(1 - \frac{1}{S}\right)(W - MPL) - c_1\left(1 - \frac{1}{S}\right)\frac{g+v}{p}MPL \quad (5)$$

where  $c_2, c_1$  are the marginal propensities to consume of the families (including their migrant members) of the successful and the unemployed migrants respectively. If  $c_2 = c_1 = c$ , (5) reduces to

$$SWR = MPL\left(\frac{g+v}{p} + 1\right) + c\left(1 - \frac{1}{S}\right)\left(W - MPL - \frac{g+v}{p}MPL\right) \quad (6)$$

Further, if the labour market equilibrium condition is given by

$$MPL = \hat{p} W \quad (7)$$

where

$$\hat{p} = \frac{1}{\frac{g+v}{p} + 1} \quad (8)$$

that is, probability of employment is evaluated at the margin, then in equilibrium the first term in (6) reduces to  $W$  and the last component of the second term reduces to zero. Thus

$$SWR = W \quad (9)$$

However, if for example the alleviation of the surplus constraint motive for rural-to-urban migration is considered – as it should be – then, it is inappropriate to assume that  $c_2$  (- the marginal propensity to consume out of added income by the family, migrant included, whose member has succeeded in capturing a higher wage urban job) is equal to  $c_1$  (- the marginal propensity to consume by the family/families whose income has diminished). Since in equilibrium, with  $c_2 = c_1 = c$  the net change in consumption is zero i.e.

$c_2(W - MPL) - c_1 \frac{g+v}{p} MPL = 0$ , with  $\underline{c_2 < c_1}$  the net change must be negative

that is

$$\Delta = c_2(W - MPL) - c_1 \frac{g + v}{p} MPL < 0 \quad (10).$$

Therefore

$$SWR = W + (1 - \frac{1}{S}) \Delta < W \quad (11).$$

To sum up, if planners are to avoid getting the cost of labour quite wrong and if the approach outlined in section A. is accepted, more labourers should be employed in a public sector urban project than is suggested by equating labour productivity to the urban market wage rate.

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## RESUME

### Répartition des revenus et décisions en matière de fécondité : Incidences d'une nouvelle approche appliquée aux migrations des campagnes vers les villes dans les pays moins développés

Cette communication présente les contours d'une nouvelle approche de la théorie des migrations rurales vers les villes dans les pays en voie de développement. Les implications de cette approche sur l'inégalité de la distribution des revenus, les décisions en matière de fécondité et le taux de salaire du travail clandestin sont étudiés.

L'unité de recherche est la famille agricole maximisant son utilité dans son contexte agricole spécifique. Les changements de composition de la famille engendrent un stimulant à changer la technologie de la production. La nouvelle technologie à la fois requiert des surplus et accroît les risques. L'insuffisance de surplus et l'aversion pour le risque, d'un côté, et les caractéristiques de l'état institutionnel et non-institutionnel de "risque et surplus" auquel la famille du petit fermier doit faire face, de l'autre côté, la rendent incapable de mener à bien le changement technologique. La migration d'un membre de la famille, en contournant les marchés du crédit et des assurances qui ont des préventions contre les petits fermiers, facilite le changement. Cette migration réussit en agissant via son double rôle dans l'accumulation de surplus et - à travers la diversification des sources de revenu - dans le contrôle du niveau de risque.

L'incorporation de cette approche dans l'évaluation de l'impact des migrations rurales vers les villes sur l'inégalité de la distribution de revenu par taille, suggère la remarque suivante : l'impact direct des migrations rurales vers les villes est une distribution égalisatrice lorsque les migrants qui sont membres des familles pauvres d'un secteur pauvre rejoignent un secteur moins pauvre et que, par voie de conséquence, eux et leurs familles pris ensemble deviennent moins pauvres.

L'incorporation de l'approche à l'étude des décisions de fécondité suggère que les enfants devraient être vus comme produisant un bénéfice additionnel notamment le déplacement du risque et des contraintes du crédit inhibant le changement technologique dans le secteur rural. Donc, exactement comme un système d'assurance sociale peut être considéré comme essentiel pour diminuer le "montant de la provision pour la sécurité des vieux jours" en ayant des enfants, de même un aménagement institutionnel fournissant l'approvisionnement en crédit et le contrôle du niveau de risque peuvent être demandés pour diffuser le "mobile de la migration" en ayant des enfants.

En ce qui concerne le taux de salaire du travail clandestin, l'incorporation de l'approche dans un modèle représentatif des modèles couramment dominant la littérature sur les migrations rurales vers les villes implique que le taux de salaire du marché dans le secteur urbain surestime le taux de salaire du travail clandestin.