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EDUCATIONAL INVESTMENT, RURAL  
PRODUCTIVITY, AND RURAL-URBAN  
MIGRATION: SOME NOTES

by

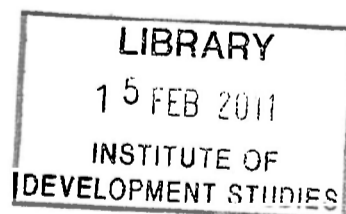
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EDUCATIONAL INVESTMENT, RURAL PRODUCTIVITY AND RURAL-URBAN MIGRATION:

by

Peter N. Hopcraft

Abstract

The evaluation of benefit streams from educational investments present particular difficulties in countries with chronically distorted wages in the "formal" urban sector and rapidly changing supply-demand relations for educated labour. Particularly problematic is the gap that opens up between the private and the social payoff to the investments and the conflict over both the quantity and "mix" of different forms and orientations of education in any expansion of the system. The private returns generate the political pressure, but the social returns should presumably be considered in any economic rationale for the investments.

These notes, with the help of a simple migration model, look at some of the issues connected with the estimation of educational benefits, and conclude that it is rural and agricultural pursuits, into which the increments to the educated labour force are going to have to be absorbed (despite whatever they hoped about an urban wage job), that must now be examined with respect to the payoff of educational expansion. This conclusion follows from the requirement that we concern ourselves with the margin (i.e. increment to supply), and with social rather than private returns.

These somewhat random notes were written in response to a last minute request, made in the short hectic period before my departure for a year to analyse a large quantity of data that might shed light on some of the above questions. They undoubtedly bear the stamp of the innumerable interferences and preoccupations that inevitably characterize such a period.

A large part of the justification for the rather massive investments that are being made in the educative field is that they will pay off in real economic terms. There are various ways in which this payoff can be garnered by an economy or an individual, but fundamentally they require that the person educated have a job (with job defined to include self employment) and, as far as the economy is concerned, that he be more productive in that job than he would have been had he not been the recipient of the educative investment. It is, of course, possible for the individual to receive his payoff by using his educational attainment to get himself a higher paying job than he could otherwise have acquired, despite the fact that he is no more productive in that job than someone with less education or than he would have been if he had not had so much education; here, indeed, is one of the areas of market failure which motivate the enormous private pressure for more education, way beyond the point at which it is justifiable socially. An understanding of this divergence between the social and private payoff to education is crucial to investment decision-making in this area. We will return to it anon.

By virtue of the fact that it is relatively cheap and easy to expand school output, and expensive and difficult to expand employment to keep pace, an increasing proportion, and certainly an increasing number of school leavers face "unemployment" in the sense that they will not be able to get the sorts of jobs they would like and for which their schooling has, at least in terms of expectations, prepared them. If this definition of unemployment is accepted, and it is certainly the definition implicit in a good deal of the discussion of this issue, then the main effect of additional education is to swell the ranks of the unemployed. To the extent that the additional school-leavers that do not find the employment they are after persist in a fruitless search for an "appropriate" job, both they and society are denied the payoff of their education, and to the extent that their education makes them persist in unrealistic job-hunting and turn down agricultural or other employment where their marginal product could, at least, have exceeded zero, both the private and public returns to education are negative, and education does indeed increase unemployment. Society's payoff may become substantially negative if these educated unemployed become more disruptive or capable of extracting more in terms of consumption goods, services and amenities than they would otherwise have been.

Let us assume for the present that the former kind of negative payoff, resulting from the greater propensity of the educated to persist in unrealistic hopes for "modern sector" employment will not continue indefinitely.<sup>1</sup> In other words, while there will always be an urban pool of hopefuls (whose size, for given migrant preferences, is generally thought of as depending positively on the rural-urban wage gap and on the probability of finding an urban job),<sup>2</sup> the vast majority of school leavers will eventually end up in some sort of employment in the rural areas.

For this group that does take up rural employment, the necessary condition for a positive payoff to their education has been fulfilled: they are involved in some productive activity, they have jobs. For that condition also to be sufficient, however, depends on this educated group being more productive in the jobs they have than they would have been had they not been the recipients of the education.

The major contention of this paper is a direct consequence of the arguments presented so far, it is as follows: the economic rationale for expanding education, and the direction in which society should, from the economic point of view, expand its educative investments, depends on the payoff, and the relative payoff to different types of educative activities, in the rural areas. The reason is simply that the vast majority of the increments to the educated labour force resulting from these additional investments are going to be employed, if at all, in the rural areas.

It should be noted that the contention is obviously not that all educated people will have to find jobs outside the modern sector; the contention refers to the margin, to the educated labour force increments that are the product of expanding the school system. But it is the margin

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<sup>1</sup> I use quotations for modern sector because of the view that it is a non-indigenous subsector of the modern sector that sets the aspirations in terms of wages in urban employment. The "informal" urban sector, generally low in wage and sparing in its use of capital does not lend itself in the same way to dualistic model building, that generally relegates it, in fact, to the other ("traditional", "subsistence", "rural" or some such title) sector, despite its far more indigenous, and perhaps less anachronistic, characteristics. With this brief apology these notes will, albeit shamefacedly, follow the dualistic approach.

<sup>2</sup> See Harris and Todaro (1968) and a long line of migration models since.

that must be examined in any attempt at rational investment decision making, and the educational sector is certainly no exception to this rule. The fact, for instance, that our schools have made, and continue to make an enormous contribution to the development effort, providing the economy with the educated manpower which is essential to the functioning of the entire productive system, is, in itself, no argument for expanding the schools. It is particularly no reason for expanding the schools if the payoff to the additional investment in school-leavers is very low or negative. The rationale for expanding the school system must be sought in the area where the additional school-leavers, resulting from the expansion, will be employed, and in the difference their educational experience makes to their productivity in that employment. The overwhelming weight of evidence that the existing school system can already oversupply the needs of the modern sector by a very large margin, certainly at the primary school level, and that the relative rate of expansion of school leavers and modern sector employment is such that additional school-leavers are going to have to return to the rural sector, is now too well documented to bear repetition.. An expansion of schooling is going to result in an expansion of the number of school leavers who enter agriculture.

One of the most striking findings for anyone who looks at data that include both educational level and some indication of employment history for rural people in Kenya is likely to be the marked association between any form of schooling and, at least attempted, migration out of the rural area and into wage employment.<sup>3</sup> Perhaps the most familiar historical characteristic of the school system, at least in terms of the expectations of its clientele, is its orientation away from rural and

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<sup>3</sup> In my own survey, "piggy-backed" onto the Small Farm Enterprise Cost Survey of the Ministry and Finance and Planning Statistics Division, all of which has yet to be analysed, the association was very evident, even at the data coding stage. The main survey, which contains detailed economic data gathered in twelve monthly visits from a sample of some 1,700 farms throughout Kenya, together with the additional survey which was designed to discover the human resource characteristics (i.e. the schooling training, extension exposure, farm and non-farm experience, etc. ) of the farm decision-makers concerned, will now be used to answer questions about the returns to different types and forms of educative investment in the small farm sector.

agricultural pursuits. There is, in fact, a considerable history of parental antagonism to any efforts on the part of educators or school reformers to reorient the school toward rural concerns and occupations. The educators have frequently responded to this antagonism with the implication that it is highly irrational. It is now emerging, however, that the migration decision has often been a very rational response to the incentives as they exist for the potential migrant, especially, as we shall see, if he has been to school. Whether this orientation to education is rational from a social point of view, and even whether it will continue to pay off privately, we will now discuss.

To facilitate a discussion of the migration phenomenon and to permit us to look at the effects of education (i.e. schooling) on the principal variables in the migration decision, let us formulate, in grossly oversimplified fashion, the calculation for (e.g.) a school-leaver who has the choice of either staying and working on the farm or migrating in search of an urban job.<sup>4</sup>

Let us, then, envisage a potential migrant who has the option of going to town and spending a year hunting for a job, at the end of which time he either suddenly finds a job with which he stays, or else comes back to work on the farm. His other option is, of course, to remain and work on the farm. At any point in time he must compare the anticipated present value of the income (read utility) stream,  $V_1$ , that he expects from embarking on a job hunt, with the value of the stream,  $V_2$ , that he can expect on the farm. If  $V_1$  and  $V_2$  depend on the migrant's time preference rate,  $r$ , the urban and agricultural wage rates,  $W_u$  and  $W_a$ , and on the probability,  $P$  of finding an urban job at the end of the year, failing which an agricultural job can be taken up, either job being kept up until year  $T$ , then:

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4 Connoisseurs of migration models are going to miss all the trimmings and refinements that bring the models closer to reality. This one can not even boast a frosting, let alone cherry and candles. Migration here is instantaneous and costless, the effects of differential amenities are ignored, the rural job is always ready and waiting and the urban job is an all-or-nothing proposition at the end of a year's search. There is no room for informal sector urban employment or half-way houses. If a job is found it is held at a constant wage until year  $T$ , when the worker presumably drops out of the labour force. Perhaps most serious for our purposes, this initial formulation does not allow for differences between migrants. We discuss the relaxation of this migrant uniformity assumption later and particularly the desirability of including educational subscripts, but even that is not treated formally here.

$$V_1 = PW_u \sum_{t=1}^T (1+r)^{-t} + (1-P) W_a \sum_{t=1}^T (1+r)^{-t} \quad (1)$$

$$V_2 = W_u + W_a \sum_{t=1}^T (1+r)^{-t} \quad (2)$$

At any point, it is worth continuing the search for an urban job if  $V_1 > V_2$ , i.e., if:

$$PW_u d + (1-P) W_a d > W_u + W_a d \quad \text{where } d = \sum_{t=1}^T (1+r)^{-t} \quad (3)$$

$$\text{or } Pd (W_u - W_a) > W_a \quad (4)$$

$$\text{or } P > \frac{W_a}{d (W_u - W_a)} \quad (5)$$

To shed more light on P, the perceived probability of finding urban employment above which a migrant will be motivated to stay in the pool of urban job-hunters, let us note that

$$d = \sum_{t=1}^T (1+r)^{-t} = \frac{1 - (1+r)^{-T}}{r} \quad (6)$$

$$5 \quad \text{Let } d = \sum_{t=1}^T \left(\frac{1}{1+r}\right)^t = \sum_{t=1}^T x^t = x + x^2 + \dots + x^T, \text{ where } x = \left(\frac{1}{1+r}\right)$$

$$\therefore xd = x^2 + x^3 + \dots + x^{T+1}$$

$$\text{Subtracting: } d - xd = x - x^{T+1} = d(1-x)$$

$$\therefore d = \frac{x - x^{T+1}}{1 - x}$$

$$d = \frac{\left(\frac{1}{1+r}\right) - \left(\frac{1}{1+r}\right)^{T+1}}{1 - \left(\frac{1}{1+r}\right)} = \frac{\left(\frac{1}{1+r}\right) - \left(\frac{1}{1+r}\right)^{T+1}}{\left(\frac{1+r-1}{1+r}\right)} = \frac{1 - \left(\frac{1}{1+r}\right)^{T+1}}{r}$$



and that if  $r$  is positive and  $T$  is large,  $(1+r)^{-T}$  can safely be ignored.  $d$ , therefore, becomes  $\frac{1}{r}$ .

Using the above in (5) we see that the job-hunter will not be motivated to return home while:

$$P > \frac{rW_a}{(W_u - W_a)} \quad \text{or} \quad P > \frac{r}{\left(\frac{W_u - W_a}{W_a}\right)} \quad (7)$$

the probability of finding a job is greater than the rate at which the future is discounted, over the proportional urban-rural wage gap, which we might call  $g$ .

It is perhaps surprising, trying out some likely figures in the above inequality, what a low probability of finding an urban job will still attract migrants to maintain the search. If the urban wage is only twice the rural, so that  $g = 1$  then the "indifference probability", that probability of finding an urban job which leaves the migrant indifferent between searching for one for another year or going home (ignoring transport costs), is  $r$ , the migrant's rate of time preference (interest rate).

For a given wage gap and a given perception of  $P$ , it is clearly  $r$ , the impatience factor, which equilibrates the number of migrant job applicants. One might think of a migrant with an initially low  $r$ , considerably below the perceived  $P$ , hunting fruitlessly for a job, wearing out the welcome of his kin, and finally using up whatever resources he has. Over this period,  $r$ , his time preference rate for cash, must climb quite steeply until it is clearly above  $P$ , at which point he gives up the search, goes home and tries his hand at (presumably available) rural employment.

The other mechanism explaining the return flow is, of course, a changing perception of  $P$ , the probability of finding an urban job. A migrant may, in the initial stages be quite sanguine about his own prospects, his personal perception of  $P$  might be quite high. Again, after a few years of being turned down and met with "hakuna kasi" (no work) signs his perception of  $P$  might be considerably lower.<sup>6</sup>

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<sup>6</sup> His objective  $P$  might of course decline as well over a period. Employers are often (understandably) chary about taking someone who has been out of work for too long.

The circular flow of migrants to and from town can be thought of in terms of a stream of people for whom  $P > \frac{r}{g}$  coming from the rural areas into town where, for the unsuccessful ones,  $P$  declines and  $r$  increases until the indifference point is past and they return to the farms. (see fig.1)

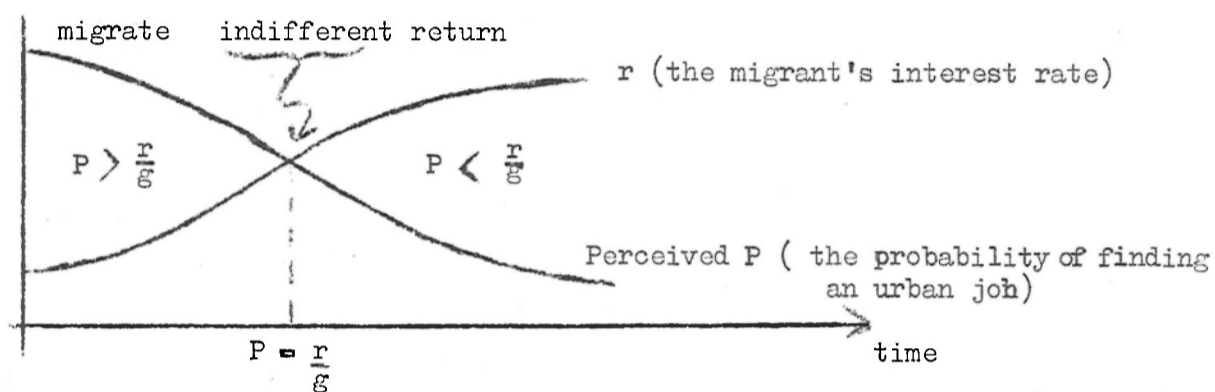


Fig.1. The Flow of migrants to and from the urban areas (drawn for the case where  $w_u = 2w_a$ )

Turning to the urban-rural earnings gap,  $g$ , it is clear that for any  $P$  &  $r$ , a greater  $g$  will decrease the right hand side of inequality (7) with the obvious and familiar result that the incentive to migrate or continue the search for an urban job is increased. For a given  $r$  of, say, 10% and urban and rural wages of shs.140/- and 70/- per month, respectively, the perceived probability above which it would be worth continuing to hunt for an urban job would be  $\frac{10\%}{(140-70)/70} = 10\%$ . If  $w_u$ , the urban wage rose to shs. 210/- per month, with  $r$  and  $w_a$  remaining where they were, any probability of finding an urban job above 5% in a particular year would motivate a migrant to stay in the pool of applicants.

We must now ask what the effect of education is on our prospective migrant and his calculation. The two clearly identifiable effects are on  $p$ , the probability of finding a job, and on the wage gap,  $g$ , that he sees when he looks at the possible jobs for which he might qualify. In both cases the net effect of education is to substantially increase the attractiveness of migration in comparison with its attractiveness to his less educated fellows.

There is considerable evidence that in Africa as well as elsewhere, education is, rationally or not, frequently used as a selection device by

employers, even for jobs not obviously requiring whatever education imparts. The employer, faced with a large number of applicants, and the requirement that he make a selection, can either devise a mechanism for evaluating and selecting prospective workers himself or use whatever information is already available to perform the selection. The costs or the difficulty of the former usually drive the employer to the latter, and the latter frequently involves an educational record, with all its shortcomings.<sup>7</sup> In any event, the effect of education on P is in general to elevate it for those individuals with more education than their fellows. It is undoubtedly a recognition of this effect that motivates, at least in part, the fervour for education that is such a familiar characteristic of countries such as Kenya.

The problem that is less readily recognized (whose recognition is, in fact, resisted), and here again we have the implications of the divergence between private and social returns, is that while education raises P for those who have had more education, it largely raises it at the expense of those who have had less. One hesitates to be categorical on this topic, but this writer is unaware of evidence to suggest that the ex post  $\bar{P}$  for the population as a whole is significantly raised by additional education per se. If (following Maurice Scott, 1972) the flow of workers hired into (wage or self-employment in) the urban sector each year is H (where presumably,  $H = h(N) + q(N)$  where N is the total labour force with h being its annual growth rate and q its quitrate), A is the number of applicants who would like those jobs in that year, and  $\bar{P}$  is the average then:  $\bar{P} = \frac{H}{A}$  (8)

While the P for any individual is, rationally or not, in general substantially elevated by that individual's education, this writer is of the somewhat pessimistic and unpopular view that  $\bar{P}$  is not, and that the net effect of education on  $\bar{P}$  is, in fact, likely to be negative.

To examine the plausibility of this view we should briefly look at the possible effects of education on H and A. Starting with H, there are two principal reasons why the number of new people who find remunerative employment in the sector we are discussing might be increased by more education: the first is that a more educated populace might be the occasion for more

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<sup>7</sup> Perhaps the ultimate irony is the possibility that e.g. reliability or physical strength and academic performance are inversely related and that an employer will select on the latter criteria for one of the former qualities.

entrepreneurship and therefore both more hirings and more "formal" self-employment. While this is a proposition that certainly has appeal, there is precious little evidence to support it. Marris and Somerset in fact found that education was negatively related to entrepreneurship in their study, as did Callaway in Nigeria.<sup>8</sup> One might add that there is little in the school experience that might be expected to engender entrepreneurship in the school-leaving population. (Attempts to analyse the effects of education as it should be rather than as it is and as it is likely to be are implicit in a good deal of the naively sanguine approaches to this issue. Rational discussion of the curriculum and content of the school experience are highly relevant here. (e.g. Court) "If only" types of analysis are not).

The second reason why education might have a positive effect is that the availability of a more educated work force might increase the rate of new investment, raising H. In Kenya there has been something of a history of idle investible resources, suggesting that skilled labour is the bottleneck to more rapid growth. The only question that remains to be answered before concluding that education can indeed raise H is whether the schools are producing the skills that are required to complement the investible resources. What is need is skilled, not necessarily schooled, labour. Again, the average school experience is not necessarily going to make the applicant that much more attractive an employee for most jobs. While school performance may be used by employers to sort out the ability levels of a given group of applicants, employers are probably more interested in school performance as an indication of differential intelligence (i.e. as a selection device) than the acquired (geography, French, history or scripture) knowledge that the

<sup>8</sup> One explanation frequently offered for these findings is that while the educated have opportunities in the existing formal wage-earning sector the uneducated do not. Entrepreneurship is therefore, in the "marginal man" tradition, the only outlet for their talents. Callaway is particularly insistent that entrepreneurship is learned in the rough and tumble of the market place and not in hygienic (or otherwise) school buildings. Both of these notions slightly beg the question as to whether the more schooled prospective entrepreneur, out of wage employment and in the market place struggle, is any improvement over the less schooled one. See Marris and Somerset, 1970 and Callaway, 1964.

school was trying to impart. There is even some evidence that the products of technical schools, many of which go to considerable expense to teach specific skills, are no more desirable to employers than bright "trainable" applicants who have not undergone the training.<sup>9</sup> The training is often not exactly what is needed for the particular job, and in any event, some employers regard on-the-job training, experience and evaluation as irreplaceable.<sup>10</sup>

To the extent that education increases an individual's P without increasing H, the basic ingredient for Gary Field's (1971) "bumping" phenomenon and Emil Rado's (1971) "explosive model" is present. In the pure case of bumping, a more educated worker is preferred to a less educated one in any job, resulting in a continuing strong private motivation for education, and the entire labour force becoming more and more educated, without too much effect on the wage. At the point (which I would suspect varies between fields) at which the present value of the more educated employee's greater productivity over his less educated forbear is less than the cost of his education, the bumping system is clearly socially wasteful. The private motivation to get an education in order to win in the job competition remains, but society's resources would better be invested elsewhere.

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9 Martin Godfrey, who has been examining technical education and training in Kenya and relating it to employment tells me that his interviews with trainees, trainers and employers have led him to very similar conclusions. Employers appear to be most dissatisfied with the products of vocational and technical schools, and hence quite unwilling to take them on as apprentices. The Directorate of Industrial Training in Nairobi recently sent out 3,000 application forms to firms expected to be interested in recruiting "Craft Apprentices". There were 60 replies. A part of this lack of interest might well reflect the quality of the training which, judging from the very high failure rate at the various City and Guilds proficiency tests, leaves something to be desired.

10 In this regard, the pervasive (in China) Maoist slogan of "combine theory and practice" is intriguing. Though a part of its motivation in the Chinese case is clearly political and anti-elitist, it is quite possible that the de-emphasis of formal schooling, at least at the sub-professional level, may well be a lower cost and equally efficient way of building a labour force. Professor Robin's informal impression, however, was that the "practice" in the Chinese school system is little more than manual labour designed to imbue the students with appropriate class attitudes, while employing agencies do not seem to make much effort to impart the theory (except, again, ideological theory). It would, however, be hard to duplicate the discipline and dedication of the Chinese labour force.

Turning to A, and using (8) in (7) at what we called the point of a migrant's indifference between an urban search and a rural job, we might conceive of some kind of an equilibrium number of applicants that depends on the wage gap,  $g$ , and on  $H$ , and inversely on  $r$  for any given set of potential migrants' propensities:  $A = \frac{g \cdot H}{r}$  (9)

The question now becomes whether education has some kind of exogenous effect on A, and if so, in which direction.

It is frequently held that education increases the likelihood that an individual will migrate to the urban areas quite apart from the effect of education on his chance of finding a job, or on the earnings gap that he perceives. Education in this case alternatively "opens up new horizons", "alienates him from the land" or has some other effect that makes him more likely to migrate than someone with an otherwise equivalent economic motivation.

In its extreme form there is little doubt that the notion that education itself alienates its products from their home and land has been grossly overstated; what has been taken to be migration resulting from the schooling itself is often migration because the motivation to migrate in terms of  $P$  and  $g$ , to use our formulation, is much stronger (see Foster, 1965 for a well-documented refutation of the earlier naive form of the "white collar preference" hypothesis).

Nevertheless, since a good deal of the motivation for education, both for the recipients and their families, is to increase the recipients chances of a high wage or "urban sector" job, the imperative that the rural school-leaver migrate is much greater than for his uneducated colleague. We are perhaps on thin ground here, since the social pressure on a school-leaver to migrate is undoubtedly the result of the pressure group's perception of the economic variables we have discussed. However, Joyce Mook's study (1972) of a "Non-Rural Village" some hundreds of miles from Nairobi, makes it clear that education is seen strictly instrumentally as a mechanism for attaining a wage-earning job and, even if that job is known to be virtually unattainable, the school-leaver is under a heavy obligation to those who have financed his education to go in search of it.

If education does have a separate effect on migration, (allowed by Godfrey, 1972 but discounted by Todaro, 1971) i.e. apart from its effect on the perceived probability of finding a job and the perceived wage gap, then the effect of educational expansion and a larger number of school-leavers is that A, the number of applicants for urban jobs is augmented.

If, following our earlier discussion, the number of urban sector hirings,  $H$ , is not expanded as a result of the education by at least the same multiple, the net effect of education on  $\bar{P}$ , as a glance at identity (8) will show, is negative. The average probability of any applicant finding a job is reduced. Under these circumstances education can also be said to lead to greater unemployment.

Looking briefly at the influence of education on the wage gap,

$\frac{W - W_a}{W_a}$  (or  $g$ ), one's expectation that it is larger for those with more education than those with less is strongly born out by the evidence. Without reproducing Todaro's table of average monthly money income for urban migrants in Nairobi by educational level, we can say that between 1964 and 1968, the average income for those in the Rempel sample of migrants who had completed some secondary school (Forms 1-6) ranged between 167% and 238% higher than the average income of those who had no schooling.<sup>11</sup>

While the above Rempel-Todaro figures are suggestive, being average urban earnings for each group, they include the earnings (if any) of those without formal, or even any, employment along with the employed; they thus really refer to expected earnings,  $PW_u$  rather than  $W_u$ . If the migration of each educational category is such as to maintain a uniform  $P$  between categories, the above percentage gaps retain their meaning. If the ex post  $P$  varies between categories, the comparisons between categories will be a hybrid rather than a  $w_u$  comparison.

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11 Calculated from Todaro 1971, table 6. The data on which the table is based was collected for Rempel 1971. It is interesting, incidentally to note that the average earnings for the migrants with 1-4 years of schooling is not significantly higher, and in two out of the five years is noticeably lower than the group with no schooling, suggesting that the first four years of education, if the education is then terminated, are not awarded a value in the job market.

Another problem with the data quoted is that it does not include  $W_a$ . The question is: to what extent does  $W_a$ , the earnings in the agricultural sector, vary with educational attainment. To speculate on this topic would be to anticipate the findings of the data analysis upon which I am now planning to embark. It must be recognized, however, that neither small-farm sector wages nor a fortiori self-employment earnings are likely to be subject to the inflated "educational pseudo-earnings" that frequently occur in the formal urban sector. Education, in other words, is unlikely to be rewarded unless it enhances productivity. In the extreme case, education would not affect agricultural earnings at all while it would substantially enhance urban earnings. In this case education would widen the wage gap by the increment in urban earnings attributable to the education. Even if  $\frac{W_{ae}}{W_a} = \frac{W_{ue}}{W_u}$  (where e means that w includes the incremental wage attributable to education), so that the percentage enhancement of the wage was identical in the two sectors, the greater absolute wage increment in the urban sector would mean that the more educated workers found themselves with a greater economic incentive to migrate.

The final, and perhaps most serious problem with trying to use current urban wage-by-educational-level data is its static nature. If something akin to the Fields "bumping" phenomenon does take place, with more educated people being chosen to fill lower and lower slots on the labour skill hierarchy, this cannot avoid putting downward pressure on the  $w_{ii}$  (where i refers to the educational level). Note that this does not require a decline in the wage for any particular post; it is, in fact, quite consistent with an increase in wages. All that is required is that (e.g.) whereas a fourth form leaver used to be able to step right into a senior clerical, or even even executive job, he now has to be satisfied with the job of a messenger, which carries a considerably reduced wage tag. What is clearly needed is a dynamic model in which all the variables entering the migrants calculus are subscripted for educational category, but that is not the task of this paper. Suffice it to repeat that the most evident observation about the



educational sector is the rapidly expanding supply of almost every category of educated manpower; and that this expansion on the supply side is completely unmatched by any absorptive capacity in the formal wage-earning sector. Under these circumstances, either  $W_{ui}$  or  $P_i$  (i again referring to educational category) are going to have to come down, there is no alternative. Once again it should be stressed: the private incentive, and therefore the political pressure for more and more education will remain, but at the point where the labour force's increased real productivity does not at least justify the educational expenditure, there is no social justification for educational expansion.<sup>12</sup>

As has been mentioned, the private justification for education has been almost exclusively in terms of a formal sector, wage earning job and, if the bumping phenomenon holds, it will remain so, long after the point where there is any social justification for the education. Even as far as this private incentive is concerned, however, the increasing costs of education, the declining probability of getting a job, or the declining wage, or all three, will eventually become evident to both the students and their parents, with the urban orientation of the incentive

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<sup>12</sup> It is not, incidentally, being asserted that the bumping system is necessarily socially wasteful, or even that the point at which it becomes wasteful has yet been reached. The educational system itself, as a final user of its own product, is one case where one might expect the ousting of less educated by more educated workers to have positive benefit; there is little doubt that the training and extension staff of government agricultural institutions is another (to be certain of this, of course, one would need to know the differential effect on farmer output of contact with extension workers of different educational levels; there is some evidence that formal schooling, or even specific initial technical training is less important than institutional arrangements that build in constant retraining and up-grading of these personnel but, ceteris paribus, the usual assumption is that education helps. (See David Leonard, 1973 for some interesting findings on this topic). One of the effects of bumping is likely to be the forcing of better (or at least, more educated) people into less attractive areas where, perhaps, they will more than pay for their education.

for schooling perhaps becoming dulled somewhat.<sup>13</sup> At that point, and we would emphasize again the lag involved here, and presumably an informational or cultural lag should also be added to the objective lag described in the last paragraph, parents and students will justify their educational investments in terms of incremental productivity in the informal, agricultural and self-employed sector. Under these circumstances the type of education demanded by the rural clientele of the educational system would of course be totally different.<sup>14</sup> The social case for the rethinking and reorientation of the educational system and educational priorities is upon us. One might predict that it will be a few years before the private case, and therefore the political pressure, catch up.

And where does all of this lead us? First of all, in any assessment of the economic payoff of education, the use of the wage, or life-time earnings profiles by education on the basis of interviews at factory gates in principal cities to evaluate the benefits of education (see Thias and Carnoy, 1972) must, in view of our discussion, be seen as a somewhat hazardous approach likely to shed a misleading light on

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13 If the bumping system held for all sectors of the economy there would presumably be no end to the private demand for more education. As soon as a sector is introduced where the educational label is not the sole criterion of selection, there is a point, prior to a population of Ph.D.s, that the demand for education declines. In view of the fact that employers are often quite conscious of the "over-educated for the job" possibility, with over-education generally implying that a worker is less amenable to discipline, less reliable and, because of his elevated expectations, more dissatisfied than a worker with less education (see I. Berg for considerable evidence on this subject), the assumptions of the explosive model will, in any event, cease to hold long before that point is reached.

14 All of this raises a fundamental role conflict of the educational system: its first, manpower planning type of role, that of equipping the economy with the educated manpower it needs, tends to make the system compartmentalized, exclusive and elitist. Its second and highly significant role is in the area of equity: to do something about equalizing opportunities so that merit, rather than breeding, determine access to elite status for each succeeding generation. Taking this second role seriously virtually precludes any policy sanction for the sort of dualization to which our analysis seems to be pointing.

investment decision-making in the sector. Urban wages must be viewed as "disequilibrium" wages in every sense of the word. While they may represent the expost marginal productivity of labour in the employing firms, simply because these firms will presumably take the wage that they must pay, and hire to the point where the contribution of the marginal worker is equal to that wage, they certainly do not represent the current market-clearing, scarcity price of labour by educational category. They are, in fact, a creature of labour market imperfections, and can not be thought of as reflecting the social value of the marginal, educationally subscribed labour unit. The further reason why the wage might be considered to be misleading is the dynamic one that the scarcities, especially for the more educated categories of labour, are changing very rapidly, despite which the wages are predictably resistant to any adjustment downward.<sup>15</sup> Minimum wage legislation, trade union activity, and the tenuously based, self-fulfilling preconception that leads to the use of educational criteria as a job licencing mechanism, conspire to make modern sector wage by education data in a rate of return to education analysis, of modest enough value from a private

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15 Presumably, either wages on the probability of finding a job can make the adjustment, thus more or less maintaining the expected wage. Richard Porter to whom I am grateful for a discussion on this issue, suggested that this expected wage might be a good indication of the social or "shadow" wage. But unless this becomes the actual wage and the market is approximately cleared (with allowances for "frictional unemployment" and unemployables, the percentage of which might be quite high where experience in wage employment is short-lived), it is not possible to think of this expected wage as the product of the marginal educated person. It will be the wage that motivates the private education decision, but cannot be used to motivate public investments.

financial point of view (though the wage, weighted by the probability of getting that wage, should shed some light on the private case), and of virtually no value from the economic point of view.

Secondly, it can now be seen, I think, that an investigation into the economic returns to the various forms of educative activity in the farm sector, and some information as to how knowledge factors affect the productivity to farmers and farms is central to pending decisions as to how far, and in which direction, to expand education. The content of our discussion thus far also suggests far-reaching implications for the nature of the educative system, and for the relative weights that should be given to the various components of the system.

Essentially we have concluded that while the private educational investment decision is still likely to be geared toward the formal urban wage-earning job, the social educational investment decision, i.e. decision to expand the size of the educational sector, must look to the payoff in the rural areas. We have, I think, also concluded that the time-honoured use of wage data, with its time-honoured assumptions about the marginal productivity of skill subscribed (and therefore education subscribed?) labour cannot be relied upon as indicators of the social payoff of education, providing the basis for decision-making in this area.

While, as we have indicated, our skepticism about wages may not apply in the agricultural small-holder sector to which attention now needs to be turned, in general, we are now dealing with family farms and self-employed farmers who do not earn a wage in the usual sense. Rather than rely, therefore, on either a highly dubious, or a non-existent, wage, what is now required (and what we shall attempt in the near future) is an evaluation of these factors by more direct recourse to the production function. This approach, whose spelling out is going to have to wait for a subsequent paper, has a number of advantages which we hope to exploit. Fundamentally they involve the possibility of capturing a far wider range of the effects of educative inputs on the

farm firm's productivity and value added, and of testing the mechanism by which production is affected.

As a quick preview of the direction in which the analysis will now turn, let us briefly say that there are a number of possible ways in which educative inputs could affect the productivity of the farmer-entrepreneur. The first is obviously that he becomes a more efficient, knowledgeable or skilled worker, that for given resources he thus extracts more output. The effect here may simply be one of greater manual dexterity, or of more knowledge of how and when to do things, a typical case being a farmer who learns how to prune his tea or coffee trees in a way that yields him greater output. The physical production process of the farm is full of numerous tasks that must be understood and mastered if the output from the resources used is to be maximized. The contribution of education in this case is to make the farmer a more efficient user of given resources. It seems likely that educative inputs that have this "worker effect" (to use Finis Welch's term; Welch, 1970) are likely to be of the type that reach the practicing farmer, or someone who very soon will become one, and teach him rather specific skills that refer to particular enterprises with which he is, or soon will be, involved.

The second, and quite separate effect that educative inputs might be expected to have are on what might be termed the "management ability" of the farmer. In this case we assume a gap between the profit-maximizing combination of farm enterprises and inputs and that combination that the farmer is currently using. The contribution of education here is the amount by which it closes the gap. Technical skills undoubtedly enter this management decision-making contribution; without the technical knowledge, new lines of production for instance, can hardly be embarked upon. The principal contribution of education in this case, however, is in the area of the farmer's ability to choose, and to allocate his resources between the various possibilities open to him. In this sense, his education may result in his being aware of more of the alternatives, or at least of his being able to grasp the technical and the payoff

implications of the alternatives, or secondly it may simply improve his ability to calculate what the profit maximizing combination or level of activities might be. The "efficient peasant" may on average be true, especially in circumstances of a static technology. When technology is rapidly changing and new, and often conflicting, information is constantly becoming available, there is no doubt that the ability to evaluate and decode the stream of information, and incorporate what is worth incorporating into a production system is rewarded in the market. (see Nelson and Phelps, 1966). When, to this technical decoding task, is added the complications of fluctuating and uncertain prices for both inputs and outputs, it becomes clear that the allocative decisions of the farmer are highly complex. It is possible that education equips a farmer to deal with this complexity better than his uneducated colleague. It seems likely that the educative inputs that perform this latter function are of a different nature to the inputs that affect the farmers farming skills referred to in the previous paragraph.

To conclude these somewhat random notes, let us, rather than attempting to summarize, keep our attention on the rural and agricultural sector. There is little doubt that if agriculture is to be intensified and the productivity of the rural areas increased, the stock of "human resource factors" and embodied knowledge must expand; its failure to expand can, in fact, where complementary factors are present, result in serious limitation to growth. To the extent that educational inputs increase this stock of useful knowledge, therefore, they are a crucial component of any serious, long-term effort to raise agricultural productivity. Traditional factors and traditional technologies may well (following Schultz) be efficiently used and leave little scope for improved productivity as a result of educative types of inputs. A large part of the agricultural development task, however, is precisely to introduce new factors of production and new technologies into the farm production systems of large numbers of individuals. These new factors

that are, we would contend, the basis for the sort of agricultural growth that is now needed, require, and to a certain extent consist of, fresh knowledge and fresh skills embodied in farmers, and fresh sources of information streams to them. Whether this means that historical inputs of an educative nature explain the observed variation in a number of different indicators of farm performance will, it is hoped, soon become the subject of a rather more detailed, empirical investigation.

In preparing this paper I have been much helped, and occasionally even influenced, by the thoughts of my IDS colleagues of whom I should mention Walter Elkan, Martin Godfrey and Richard Porter. George Johnson, though no longer here, has left an indelible stamp. And finally there is my wife, Maeva, who in the tradition of renaissance women has the capacity for getting interested in almost anything; even, occasionally, economics.

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