

THE IMPACT OF EDUCATION ON EARNINGS,
AND OCCUPATIONAL MOBILITY IN KENYA,

by

MELBA GOMES

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ABSTRACT

The present study attempts to assess the extent to which economic differences between ethnic groups and between individuals have been reduced or eliminated by the expansion of educational opportunities in Kenya. By analysing the patterns of wage income distribution, the conditions which affect them and some of their consequences, the study attempts to explain part of the process of perpetuating income inequalities in the country.

From the analysis of a considerable amount of empirical data, a picture is painted of a society in which economic status is inherited.

For although the economic success of individuals in the labour market is strongly influenced by their educational attainments, the prior influence of inherited characteristics such as birth-order, family-size, ethnic and occupational origins on these scholastic achievements has served to create profound inequalities in individual access to income. In addition, the increasing tendency of the urban labour market to recruit the sons of other wage employees suggests that economic ties are being strengthened and perpetuated across generations.

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CHAPTER ONE
INTRODUCTION

The objective of the present study is to assess the extent to which economic differences between ethnic groups and between rich and poor have been reduced or eliminated by the expansion of educational opportunities in Kenya. By analysing the patterns of wage income distribution, the conditions which affect them and some of their consequences, we attempt to explain part of the dynamics of inequalities in the country.

The enquiry is based largely on a considerable amount of empirical data collected from a representative sample of urban employees in 1980. The questions it poses and the answers it provides thus inevitably turn on inequalities of access to or acquisition of formal employment in the urban sector. However, because additional data was collected from a sample of rural school children, teachers and parents in three provinces in the country, we have been able to widen the scope of our findings by tracing the economic success of individuals to their early scholastic, socioeconomic and geographic-ethnic origins. The latter analysis has been of particular use because almost all the individuals in the sample of wage employees were first-generation migrants from rural areas.

Many of the findings we report have significant policy implications. It is repeatedly indicated, where possible, whether the inferior occupational and earnings attainments of some groups compared with others are primarily due to the former's educational attainments, to other factors, or to a combination of both. These differences

indicate whether educational programmes would suffice or whether other actions would be necessary to redress imbalances or effect improvements in the educational opportunities of the groups under consideration.

B. The Problems Stated

When Africans gained control over the political apparatus of the country at Independence in 1963, the overriding priority became that of reorganising an economy and a society which had structured rewards according to race. The restructuring involved the Africanisation of both the public and private sectors and the attempted elimination of inequalities of opportunities between races through the achievement of a rapid and balanced expansion of the educational system. The emphasis on education was based on the assumption that education was a necessary and inevitable tool by which inequalities in income opportunities could be eradicated. And the country's recent emergence from a colonial past of unfair privileges demanded that the principle of fair competition and equal income earning opportunities be universally endorsed.

There were always two options available: the first possibility was to make the system less competitive by reducing the benefits deriving from success and the costs paid for failure; the second option was that of ensuring that everyone entered the competition with equal disadvantages and advantages, and, as has already been mentioned, it was this option which was chosen. Consequently, a determined drive was made in the sixties and early seventies to educate unrestricted numbers of children.

There were, of course, many additional and inter-related reasons for the choice of a rapid linear expansion in the formal educational system. It was assumed that investment in education was an implicit investment in economic growth, that industry would expand in a manner which would enable it to absorb the more educated manpower produced; that education would inculcate 'those cultural values which not only contribute to the enrichment of people's lives but which are essential for the maintenance of a cohesive and productive society'¹; and finally, but most importantly in the context of this thesis, that social and economic differences between ethnic groups, between better-off and poor would derive from differences in cognitive skills and these differences could be reduced or eliminated by equalising educational opportunities and educational skills. Thus, it was imagined that schools would equalise people's cognitive skills and therefore their bargaining power as adults.

In keeping with the desire for balanced educational expansion, quantitative targets for educational expansion were given to different geographical areas, and forward-planning engineers played the 'numbers game' of fitting the pattern of output to the necessary pattern of inputs. Progress in development was quantitatively measured in terms of district and provincial enrollment rates. And, indeed, in these terms progress was substantial: the number of primary schools expanded from 6111 to 10255 between 1969 and 1980 and the Government launched as many new classes in Form I as it could afford. Government-maintained secondary schools also expanded from 694 to 1682 during the same period.

1. Kenya Development Plan 1970-1974. (Nairobi : Government Printer) 1969. p. 450.

In the mid-seventies, however, a number of inter-connected problems occurred which led to a questioning of the assumptions upon which educational strategies had been based.

Firstly, a bulge in the population rate and therefore in the school-aged population forced rural schools to adopt a shift system, to cut the quality of instruction provided and to seek private assistance in order to meet the rising costs of educational demand at the primary level. The rapid linear expansion of education for a widening base had resulted in an increase in the proportion of the nation's recurrent expenditure being allocated to primary education. But reliance on private assistance resulted in fast deteriorating school quality particularly in those communities in which private contributions were insufficient to subsidise school expenditures to the extent desired. Alarm was expressed over a general inability to cope with the educational needs of a growing population.

In terms of its long-term impact on income inequality, the reliance on private assistance (voluntary parental contributions) to finance the necessary expansion of the educational system was most significant. Privatisation of primary education normally means that families of higher socioeconomic status have both the desire and the ability to finance the education of their children, while families at the other end of the economic scale have neither. And this is likely to affect both quantity of schooling (access) and quality of schools.

Regarding access to primary schools in Kenya, a caveat is in order. Normally, when one refers to private financing of education, it implies the private ability to purchase a place for a child within a school. In the Kenyan context this implication does not follow. Governmental encouragement of self-help in financing primary schools, but legal restrictions on the levy of fees in schools forced these schools to adopt unorthodox means of financing themselves. In rural areas the local communities began to raise funds through 'voluntary' contributions from parents for the purpose of constructing schools and teachers' accommodation, while the Government provided only recurrent operating expenses for teacher salaries. All children within the catchment area of the school have had the right of access to such schools. But differences in the ability and willingness of local communities to impose levies on themselves for such educational development costs have resulted in considerable diversity in the quantity of schools within geographical areas, and in the type of building material, number of classrooms and adequacy of school furniture and teacher accommodation. More and better designed and maintained schools seemed to be built in richer communities.

And the imbalancing effects of privatisation at the elementary level seemed to be reinforced because the Government undertook the responsibility of providing recurrent expenditures in primary schools. Hence those communities which could galvanise themselves into building and furnishing a school could count on public aid for recurrent expenditures. But the public action of helping those who helped themselves also meant that those who could not do so were relatively deprived of public assistance.

And therefore the public role of balancing and equalising expenditures on education in order to equalise access to educational opportunities was not - or did not seem to be - fulfilled.

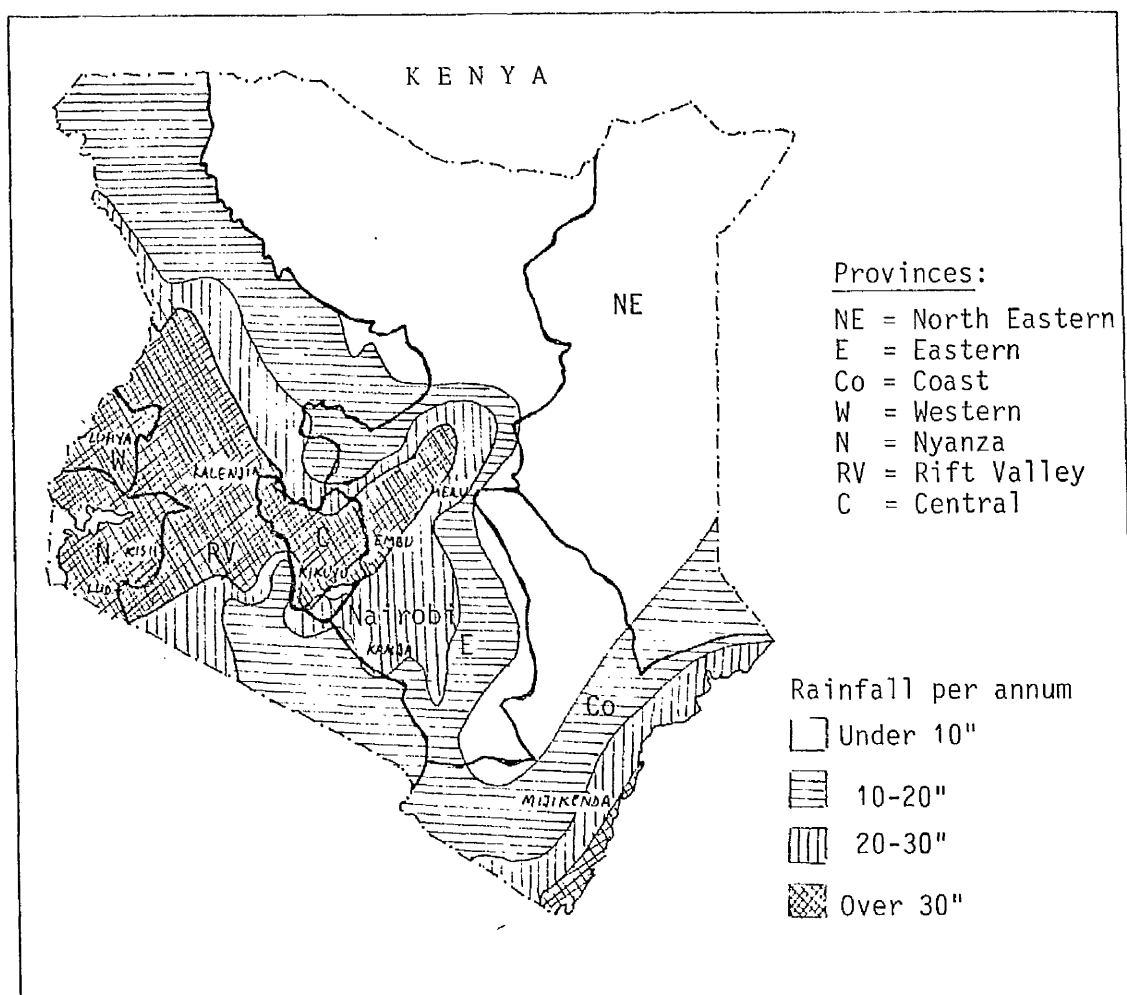
An imbalance in the quantity of public expenditures between communities and regions was one problem. What if, however, the quantity of institutional expenditures were not an exogenous variable, but were to be influenced by private demand, and in turn, capable of influencing such demand? In short, what would happen if private demand for education and institutional factors were endogenous to the system? One might then expect the distribution of preferences between and within populations to impart some of their momentum to the social system. In those communities where the demand for education was great and where the individual or family decision-making process had been consequential in improving access and physical quality of schools provided for children, the community might also be able to act collectively to induce a higher quality product or better distribution of *public* recurrent expenditures towards themselves. All other things the same, a high private demand for education might be manifest in the seduction of better quality or more effective teachers (which are allocated and paid for by the Ministry of Education) towards such schools. The process may be subtle: better teacher accomodation, better physical quality of schools, better pupil response to the educational system might persuade some teachers to stay with the school for long periods. The total effect might be one of additionally improving the quality

of such schools, altering participation and continuation rates within the community and positively affecting rates of return and in turn the private demand for education.

Although provincial accounts of public recurrent and development expenditures have not been published, it has become increasingly apparent that the distribution of Government expenditure on elementary education has matched the skewed distribution of private expenditures on education. Those areas and those ethnic groups closer to centres of employment and industry - which groups foresaw the greater role education was playing in the acquisition of formal employment and were both willing and able to sacrifice current consumption towards educational investments - were assisted by greater public expenditure on education and better quality inputs.

In addition to its direct effect on schools, the division of financial responsibility for schools between Central Government and the local community also had its consequences in increasing the private need for a cash income to pay for educational development at the primary level. In Kenya, cash income can be obtained from two sources: from the sale of cash crops or other own-agricultural production, or from a wage income in formal employment. Economic advantages and the powers associated with them have therefore rapidly come to rest upon individual access to high or medium potential land which is capable of providing an agricultural surplus, or access to wage employment - entry to which is dependent upon educational qualifications.

The irony has been that good agricultural land is geographically concentrated in a few provinces in the South-West of the country and this geographical concentration of high potential land has been economically important because ethnic groups are also concentrated within geographical areas. The figure below, which shows the provincial boundaries and the distribution of agricultural land across these boundaries, indicates that medium to high potential land (correlated with rainfall distribution) is highly concentrated in Central, Eastern, Rift-Valley and Nyanza Provinces - the stronghold of the Kikuyu, Meru-Embu, Kamba and Luo tribes.



Over 95% of the Meru-Embu, Mijikenda and Kalenjin tribes reside in Eastern, Coastal and Rift-Valley provinces respectively, and 80% of Luo, Luhya, Kamba and Kisii live in Nyanza, Western, Eastern and Nyanza Provinces respectively. This correlation applies even to

the Kikuyu who tend to be dispersed across provincial boundaries. Sixty per cent of them live in Central Province and 28% in the Rift-Valley Province.²

The concentration of some ethnic groups - Meru-Embu, Kikuyu, Luo and Kamba-in areas of good agricultural land and some ethnic groups -Mijikenda, Turkana, Samburu - in semi-arid zones has inevitably meant that there has been an unequal distribution of the ownership of 'productive assets' and this imbalance has contributed to inequalities between tribes in their ability to finance the education of their children from the production of an agricultural surplus. For the poorer tribes this has meant a relative deprivation both in terms of an agricultural income and in terms of a wage income. Indeed, the privatisation of education has meant that the two sources of income were rapidly becoming inter-related: a wage income normally dependent upon educational attainment, was now linked to the production of an agricultural surplus. The concentration of physical and financial capital in the hands of small economic elites enabled them to expand their stock of human capital through education, and thereby to control even greater shares of the national product.

There was one other problem relating to education which came to the fore in the seventies. The statistical realities of primary and secondary school enrollment - there being places in secondary assisted and maintained schools for only one-sixth of primary school leavers - had two consequences. Firstly, it was necessary to devise a means of selecting students into secondary school and

2. Kenya Fertility Survey 1977-1978. Central Bureau of Statistics Ministry of Economic Planning and Development. (Nairobi: Government Printer) 1980.

the most equitable means of selection seemed to be that based upon performance in the terminal examination of primary school (CPE exam) which soon became the sole criteria for determining whether a child went to the next stage for formal education or not. But this meant that children with less access to schools and/or to high-quality schools would have lower continuation rates from one level of schooling to another, not necessarily because of deficiencies in their own abilities, but because of differences in access and in quality of schools.

Moreover, the competitive nature of the CPE examination meant a high repetition rate in the examination. A large percentage of students began to repeat the grades prior to the CPE examination, and the examination itself, in order to improve their performance and obtain a place in a Government-maintained secondary school. In 1979, 35% of standard 7 students were repeating the CPE examination and the proportion of 'repeaters' was rising. By now the use of the examination as a secondary school selection test of accumulated learning rather than one of acquired skills meant that for those children not obtaining a place in secondary school or those children repeating the examination - and these children comprised 65% of the CPE candidates in any one year - the CPE examination was their last contact with formal schooling. But the changing nature of the CPE examination into a selection device had changed the content of classes and made primary education totally inappropriate for the practical needs of those children not continuing with formal education.³

3. Somerset, A., "Who goes to School? Efficiency, Equity and relevance in secondary school selection". Mimeographed Paper. An extended analysis of material first prepared for the 1972 ILO/UNDP Mission to Kenya, See ILO Mission report Employment, Incomes and Equality (Geneva ILO 1972) Technical Paper No. 75. pp 517-528.

To the economist, what was important about the changing nature of primary education and that of the CPE examination in particular, was the fact that the distribution of the 65% of CPE candidates not continuing with formal education was likely to be skewed in favour of children from low socioeconomic backgrounds. By the late seventies, educational statistics showed that dropout rates from schools were higher and continuation rates lower, in low-potential geographical areas.⁴

This distribution, and the suspected geographical clustering of 'high achieving' schools in richer communities would mean that children of richer communities were more likely to continue with their education because they had greater access to 'high achieving' schools. In other words, income inequalities among parents and among communities, guaranteed some degree of inequality in the effectiveness of schools and in the mean educational attainment of their children. The next logical step would be to go from community disparities in mean educational attainments to community disparities in mean income and from these strong hereditary effects on income to the transmission of inequality across generations. Parental concern about their children's future welfare and their behaviour with respect to schooling at the primary level would play a crucial role in the transmission of inequality between generations.

Finally, among the problems which came to the fore in the seventies, we must mention the observation that the skewed distribution

4. Educational Trends 1973-1977, Central Bureau of Statistics, Ministry of Economic Planning and Development, Nairobi Government Printer. 1979.

of opportunities was not limited to the educational system. In the labour market, industry expanded but clearly did not absorb educated labour to the extent planned or foreseen, and it was suspected that the labour which it did absorb had a skewed distribution in favour of some groups with strong ^{urban} labour force connections. These groups appeared to consolidate their position and pass on their advantages from one generation to the next with apparent ease.

But there had been no empirical analysis of the manner in which educated individuals within the formal labour market could use their advantaged position to improve the upward mobility of their sons. Clearly if the fortunes of children were to be linked to that of their parents through investments in education, it was possible that the maximising behaviour of parents would also permit the transfer of other endowments to their children - endowments such as market information, relative foresight about the incidence of market shortages in manpower etc. These 'endowments' seemed to be determined by the reputation and 'connections' of families and included learning, goals and other social capital acquired by belonging to a particular family culture.

The forces underlying the process of transferring privilege within the formal labour market were not clear, but what was manifest was a highly stable ranking of some families (or groups of families) within different generations concurrent with a highly unstable income ranking of other families.

Given this context and the fact that equality of income opportunity via education was a subject largely neglected in empirical analyses, we draw on data collected in a Labour Force Survey and a Schooling Survey to address ourselves to two issues - the extent to which education had been important in determining wage income, and the extent and mechanism by which widespread education had decreased or exacerbated inequalities between individuals and between groups in the pursuit of the earnings achievement principle.

The original intention was to look primarily at individual inequalities in earnings. But as we examined the data, it became increasingly clear that there were three forms of inequality in earnings: inequalities between individuals, between families or groups, and inequalities transferred across generations. And because the evidence consistently suggested that different families and kinship groups behaved in a systematic way or were subject to similar difficulties or opportunities, these kinship groups were often isolated to form the base of analysis. In retrospect these group analyses have been most interesting for two reasons: firstly it was important to establish what segments of the population experienced greater or lesser educational attainments, occupational mobility and earnings achievement and why. Secondly, these group inequalities have important implications for those interested in social policy.

In the main, the organisation of this thesis has been one in which each chapter deals with a particular issue relevant to income inequalities. Following the next chapter which reviews the

relevant theory and constructs a framework for analysis, we use in Chapter 3 the traditional approach to suggest the existence of a positive education-earnings relationship, to present the finding of rising rates of return to incremental schooling and to propose the possibility of strong kinship differences in rates of return to education.

In Chapter 4 we use regression analysis to measure the extent to which education, socioeconomic status and kinship associations have independently and interactively been important in determining differences in earnings. We establish the importance of family structure - size and birth-order - in determining educational and income inequalities between siblings.

In Chapter 5, we focus upon the connection between education and kinship groups in an attempt to assess why communities or tribes have behaved so differently with regard to the education of their children. We attempt to establish the fact that common economic constraints within communities have compelled a unified community approach to education; this has led to wide differences in the effectiveness of schools and therefore in the mean educational attainments of different communities. The thrust of the argument is that private education can and has been used by communities to strengthen and perpetuate economic ties across generations.

In Chapters 6 and 7 we move from disparities in mean educational attainments of groups to social mobility and the transmission of inequality across generations. We examine the process of social

mobility in the urban occupational structure and assess the manner in which differences in human capital and social capital (tribe) have promoted inequalities in earnings.

CHAPTER TWO

THEORETICAL CONSIDERATIONS

A. Introduction

Since the objective of the present study is to assess the extent to which economic differences between ethnic groups and between rich and poor have been reduced or eliminated by the expansion of educational opportunities, it is our intention to explore in this chapter those theoretical issues and models which pertain directly to such effects.

However, with regard to the exposition and discussion of the theory relating specifically to this issue, a problem of presentation arises because the theoretical models in the literature do not deal directly with the issues we later intend to explore; they incorporate a number of arguments which are immaterial or only of indirect relevance to our focus of interest. This is partly because the theoretical framework - the 'new household economic' model of family behaviour - which really is the Hicksian version of production applied to the family, owes its existence and development to work on fertility models. Therefore it will be difficult to discuss the full implications of those sections of the model which are germane to this thesis, to comment on the gaps in their application and indeed to outline the empirical use we shall make of these extensions of the main model without presenting the model in its entirety.

Yet, in reading the introductory arguments of the model, the reader will naturally but erroneously be led to assume that much of the subsequent empirical analyses in this thesis will be on fertility, which is, of course, not the case. But the alternative of excluding the

mathematical presentation of the model, or perhaps relegating it to the Appendices, with constant and distracting references in the text, would be unjustifiable: although the main arguments of the model are not always relevant to this thesis, the constraints of the model are often of direct relevance to the later empirical work and the reader needs to be provided with background information on these constraints.

The inevitable compromise which has been chosen involves a brief exposition of the full model in the following section. The reader is asked to note that although the full model is presented, it is provided only as a background to subsequent sections which will draw attention to specific passages of relevance to this thesis, outline some of the gaps in their application and comment on the problems involved in empirically testing their validity. The chapter will be concluded by referring to the use we shall make of these arguments, and suggesting the manner in which they will be revised with respect to an examination of income differences resulting from variations in intergenerational capital transfers.

B. The Model

No act of an individual or group is without an economic dimension although many classes of action have been underexposed to the risk of an economist's scrutiny because they do not pass through the marketplace. Until recently, the intervention of the family between the acquisition and disposal of income by individuals was an obvious case

in point. But since the recent entry of economists into the home, families have come to be regarded as a major non-market institution in which the functions of income production, pooling and disposal are seen as an integral part of the activities which constitute the family's social and economic value. However, because these functions are asymmetrically distributed across different generations of the same family, and are not constant across cultures, and because families pool both income and labour, theoretical models and empirical analyses of the flows and effects of income have been plagued with problems. The functional asymmetry between generations is, of course, conditioned by various factors: generations come in succession; parents decide to have children and not the other way around; parental allocations of labour-time between home production and the market, their transactions in capital and joint management of property etc. alter the pool and flows of family income from which they determine consumption and investment in the human and social capital of their children, and thus the initial conditions for the income generating capacity of the next generation.

If the hereditary effects on income are strong - if net transfers of human and social capital to children are close to a fixed high proportion of parental income - inequality in income is likely to be transferred to succeeding generations. Inverse associations between fertility and income and between family size and average capital transfers to children, increase income inequalities within generations, while parental behaviour regarding fertility and human capital formation, plays a crucial role in the transmission of advantages or disadvantages

between generations.¹

The capital transfers or redistribution of family income within the household need not only be between parents and children but may be between children of the same family (siblings) and even between parents and their parents. In extended kinship networks and polygamous cultures, there might be capital transactions between the head of household and his wives, between the head of household and the larger kinship group and between each father and children of different genders and matrilineal strains. The final transaction in these cultures often is between children and their forebears. Capital transfers need not be defined as financial transfers or bequests, but may be broadened to include flows of financial, human and what we call 'social capital' of race, family reputation, connections and status in the labour market.

Creating a model of these transactions and their effect on the education and earnings of individuals is a complicated exercise. The standard approach is to treat the family as a firm in which the neoclassical assumptions of fixed preferences, maximising behaviour and equilibrium are used to analyse internal production and distribution of wealth. The individual becomes part of an infinitely long-lived family which has mortal representatives or decision-makers in each generation. These central decision-makers, who may be parents, or heads of households, or, in the wider kinship groups, clan chiefs, have

T. T.P. Shultz, "Family Composition and Income Inequality" in *Population and Development Review*, Supplement to Vol 8, 1982, p 137-150 ; Gary S. Becker & Nigel Tomes, "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility" in *Journal of Political Economy*, 1979, vol. 87, no. 6; Gary S. Becker *A Treatise on the Family* Cambridge, Mass.: Harvard University Press, 1981; Sheshinsky E. and Y. Weiss, "Inequality within and between families" *Journal of Political Economy*, 90, No.1: 105-127.

the option of increasing present consumption of the family at the expense of future generations, but are discouraged from doing so by their concern for the interests of their children, and perhaps of other family members.

Consider a world in which all households are assumed to be composed of two parents plus their children. Couples can be viewed as maximising their own utility function (loosely conceived of as a pool of income) having as arguments the number of living children (N), relevant child characteristics (μ) and other services (C) yielding utility to parents.²

$$U_t = \mu(C, \mu_{t+a}, N) \quad (1)$$

The term t describes the point at which parental investment in the marginal child begins, which can be taken to be the year of birth of that child. a is the age of the child's entry into the labour force, when parental investments in the child's human capital are expected to cease. Thus $t-t+a$ expresses the period of time during which the marginal child is born and embodies human capital and other investments; the child works, consumes and produces his own children after $(t+a+n = j)$ years. Thus, in equation (1) above, parental utility is a function of own consumption and expected wealth of one's children as adults.

If $\mu_{t+a} = I'_{t+a}$ where I'_{t+a} equals the adult wealth of each child, the aggregate wealth of children can be expressed as

$$I_{t+a} = I'_{t+a} (N) \quad (2)$$

². R.J. Willis, "A New Approach to the Economic Theory of Fertility Behaviour" *Journal of Political Economy, Supplement (March/April)*: S14-64 1973.

Substituting,

$$U_t = \mu(C, I_{t+a}) \quad (3)$$

The utility function is maximised subject to several constraints.

With regard to the constraints dealing with production relations, number of children and child quality are produced using inputs of parental time and purchased consumption and investment goods such as food and education, while services are produced with parental time and purchased inputs. There might also be an added constraint (E) which describes the technology under which the family operates - partly a coefficient of ignorance about the internal workings of families and partly the recognition of different cultural and ethnic efficiencies in operating rates.

$$\mu_{t+a} = \mu\{(T_m)_{t+a}, (T_f)_{t+a}, (Y)_{t+a}, (E)_{t+a}\} \quad (4)$$

$$C_t = c\{(T_m)_t, (T_f)_t, (E)_t\} \quad (5)$$

In equations (4) and (5) above, T is the time input of the mother (*m*) or father (*f*), Y is a vector of physical units of human capital invested in children: child care, nutritional inputs, education, health, etc. Strictly speaking, Y is a vector of human capital inputs purchased and produced outside the home. Thus for example, mother's time input into her children ((T_m)) may increase the income producing characteristics of her children, but these are distinct from, although augmented by, the purchased inputs such as formal schooling, medical care etc.

There is a budget constraint which equates expenditures on inputs to the husband's income, non-labour income and wife's earnings - which is the product of her wage and her time spent in market work. If

H_{t+a} is the total amount invested in the human capital of children produced from parental time and purchased inputs, and X_{t+a} is parental aggregate wealth, and ϕ is the cost to parents of foregone consumption for each unit of H , the budget constraint can be written as

$$C_{t+a} + \phi_{t+a} H_{t+a} = X_{t+a} \quad (6)$$

There is also, of course, a constraint that the wife's time spent in producing N , μ , and C , plus her time in the labour market cannot exceed her total time. Lastly there is a constraint that the number of living children equals births times the proportion surviving. Variables such as wife's and husband's education, religion, ethnic group etc. can affect reproductive outcomes by influencing preferences between μ and C and can affect the production function by influencing preschool child quality and hence rates of return to investments in children. If the value to children of each unit of capital is ω_{t+a} , the rate of return on these investments is described by equation (7) below, where r_{t+a} is the rate of return at $(t+a)$ which may be about 20 years from t .

$$\phi_{t+a} H_{t+a} = \frac{\omega_{t+a} H_{t+a}}{1 + r_{t+a}} \quad (7)$$

The solution to the maximisation problem is a series of demand equations relating (N) or the number of child births, child characteristics (μ) and parental consumption (C) to the prices of goods and services used to produce them, the wife's wage, the husband's income, non-labour income, the child survival rate, and parameters of the utility and production functions.

The total wealth of children equals the sum of their wealth from the total human capital invested in them, from their endowed capital, and from the 'capital gain' due to luck in the market for income.

$$I_{t+\alpha} = \omega_{t+\alpha}(H_{t+\alpha}) + \omega_{t+\alpha}(G_{t+\alpha}) + \omega_{t+\alpha}(V_{t+\alpha}) \quad (8)$$

In the equation, G can be described in the Beckerian sense as genetically determined ability, race, family reputation, status and connections or child inheritances of "social capital". $\omega_{t+\alpha}(G_{t+\alpha})$ therefore describes the market value to children of such social capital inheritances. $\omega_{t+\alpha}(V_{t+\alpha})$ describes the market luck of children which is determined by fluctuations in production possibilities and prices of goods and factors of production revealed after children have entered the labour market. Parents' commitments of human capital often take place before they know about their children's market luck, although to some extent their expectations of such luck may affect their investments in the human capital of their offspring, relative, for example to their investments in non-human capital assets. The equation is presented elsewhere as the human capital earnings function.

Substituting (7) and (8) into (6) above, the parents' budget constraint can be expressed as follows, where $t+\alpha+n = j$

$$S_j = C + \frac{I_j}{1+r_j} = X_j + \frac{j G_j}{1+r_j} + \frac{j V_j}{1+r_j} \quad (9)$$

Own consumption and the income of children are determined by parental income (X_j) as well as the value of inheritances of social capital and market luck. If S_j is described as family income, parents maximise

C and I_j subject to their expectations of family income at j . If they correctly anticipate the value of endowed social capital and market luck of their children, the equilibrium conditions are given by:

$$\frac{\partial U}{\partial C} \bigg/ \frac{\partial U}{\partial I_j} = 1 + r_j \quad (10)$$

The higher is (∂I) or the lower is (∂C) , the higher will be their returns to investments. If $C = (1 - \theta)S_j$, θ being the proportion of S_j spent on children, then substituting into (9) above, the demand function for the income of children can be written as

$$I_j = \theta(1 + r_j)X_j + \theta\omega_j G_j + \theta\omega_j V_j \quad (11)$$

Where $\beta = \theta(1 + r_j)$

$$I_j = \beta X_j + \theta\omega_j G_j + \theta\omega_j V_j \quad (12)$$

Thus the adult wealth of children is related to the income of their parents through β ; their propensity to invest in their children, and to their social capital and market luck through θ , the proportion of family income spent on the social capital and market luck of children. If the incidence of market luck were to be equally distributed among all families, the fortunes of a given family could be followed over as many generations as desired, by measuring family variations in the propensity to invest in human capital and social capital.³

C. Model Implications: Education, The Demand for Children & Income

In both substance and emphasis, the model's explanation of income generation as a result of investment behaviour and other capital transfers from parents to children, marks an important transformation

3. G.S.Becker and N.Tomes, "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility" in *Journal of Political Economy*, 1979, vol.87, no.6.

of conservative theories of inequality. Here we have people being poor because of the sins of their fathers rather than by their own choice. And if transfers of human and social capital to children are close to a fixed proportion of parental income, inequality in income will be transferred to succeeding generations. Only if poor parents increasingly forego current consumption in favour of investing in the income generating capacities of their children, will they effectively narrow the income gap between their family and other richer families in succeeding generations.

In the literature, there have been two directions of analytical interest. Work has centered on the manner in which the generation and redistribution of income has affected the structure and size of the family (fertility models); work has simultaneously focussed on the manner in which the structure of the family and transactions between its different members have affected the redistribution of income. In principle, whatever the particular aspect of interest, family income and the demographic processes associated with it have been hypothesised to have influenced and in turn been influenced by income distribution; the theoretical and empirical work on the family has therefore brought together several lines of research within economics, marking another step in the convergence of demographic and economic analyses.⁴

(1) Education and Fertility: The Quantity-Quality Trade-Off

Having decided what level of family resources they want to devote to improving the income-generating quality of their children, parents are expected to decide how their resources are to be allocated between the number of children they have and the amount of reserves they invest

⁴. R.J. Willis, "The Direction of Intergenerational Transfers and the Demographic Transition: The Caldwell Hypothesis Reexamined", *Population and Development Review, Supplement to Vol. 8, 1982.*

in each child. The division of resources between quantity and quality of children is expected to be made on the basis of the relative expensiveness of producing numbers and quality and on the effectiveness of each component in generating parental utility.

It has been hypothesised that with a given resource allocation and with the goal of maximising family income, parental alternatives will be between a large number of children with relatively low potential income (low average investments per child) and fewer children with relatively high potential earnings (high average investments per child). Depending on the rates of return to investments in human capital, the value of 'raw' labour or genetically determined intelligence of the marginal child at birth, and the expected survival rate of each child, parents will determine optimal levels of investment in quantity and quality of children.⁵ Since the trade-off between quantity and quality of children is expected to be determined by the relative and absolute costs of rearing children, it is worthwhile looking at some of these costs.

Time is seen as a major cost component of children, particularly the opportunity cost of women's time and is held to account for the negative relationship found in western societies between a woman's fertility and her education: higher education of the mother means a higher opportunity cost of her time.

Empirically the hypothesis that there has been a slow unmistakable rise in relative child costs (and consequently smaller families) caused by the leverage of rising real wage rates on time-intensive children is

5. Donald J. O'Hara. 1972, "Mortality Risks, Sequential Decisions on Births and Population Growth", *Demography* 9(3):285-298 (August).

difficult to demonstrate (or refute) because it is not easy to quantify the net gain from a child in a setting in which much of the economic exchange between children and their parents never enters the marketplace. In addition, measurement of the mother's time input into the marginal child and the costs incurred is complicated for women who do not work in the market-place; for those who do, the value of her time is often held to depend on her human capital component - measured by skills and experience rewarded in the labour market - which is simultaneously determined by the number and spacing of her children. The causation may therefore run both ways, from the value of the mother's time to her choices of μ or C and *vice versa*.⁶ There is a critical distinction in the fertility models between parental time and hired time - time of cooks, nannies etc. The latter is never considered a perfect substitute for the former in the western nuclear family, to which the models are held to apply. Presumably the cost of hired time would be included in the term $\phi_{t+a} H_{t+a}$ which is added to the cost of parental time in the production of μ_{t+a} .

The true economic flows in developing countries where the family structure is not nuclear, can only be judged with the help of extensive data on the exchange of time-use within the family. The position is especially complicated in these countries because children work and produce, thus adding to household production prior to the j th year, and all the while, parents continue to invest in the human capital component of these children.

Some data has been collected, for example, in the Philippines, Java,

6. J. Heckman, "Life Cycle Consumption and Labour Supply" An explanation of the Relationship between Income and Consumption", *American Economic Review*, March 1974, 64, 188-194; J.F. Cogan, *Labour Supply and the Value of the Housewife's Time*, Santa Monica, Calif.: The Rand Corporation, R-1461-OEO/EDA/RF. 1975.

and Nepal.⁷ Perhaps surprisingly in the context of the model outlined above, the data analyses reveal that the extra child (in the Philippines, for example) does not reduce the parents' earnings over his first 20 years in their household. There is a positive effect of the extra child on the working hours of fathers; the mother's various productive tasks are all so close as to avoid any great personal loss from the extra child. The net effect is positive on parental work-hours and earnings, providing support for the view that the extra child may be a net economic asset in underdeveloped rural economies, delaying the transition from large to small families predicted by the model.

Of course, measuring the productive value of children is a problem in rural economies because so many of children's tasks are not normally performed by adults. Just because fetching wood and water, care of livestock at pasture, caring for younger children and many other tasks are normally performed only by younger children, this does not mean that such tasks do not represent a very considerable contribution to the economic welfare of the family, often by releasing adults for more onerous tasks in production, or by increasing their marginal production in the formal labour market. Thus, Reining⁸ found that Haya women near Lake Victoria in East Africa, who had no children to fetch water for them, spent an average of one hour fetching water for every two hours spent cultivating their farm. Obviously women with available children are at an enormous advantage under such circumstances.

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7. Brian L. Boulier, "Children and Household economic activity in Laguna, Philippines", 1976, University of Philippines *Institute of Economic Development and Research*, Discussion Paper no. 76-19 (29 July); Barry M. Popkin, 1976, "The Production of child Welfare in Rural Filipino households", University of Philippines, *Institute of Economic Development and Research*, Discussion Paper no 76-17 (July).
8. Reining, P. 1970, "Social Factors and Food Production in an East African Peasant Society: The Haya" in McLoughlin P. (ed) *African Food Production Systems Cases: and Theory* John Hopkins Press, Baltimore, 1970, pp 41-89.

The point is that raising a child involves an absolute cost - independent of the human capital element - and this can be measured in terms of benefits (production and psychic benefits to parents) subtracted from total cost, which can be measured in terms of time and other resources sacrificed to raise the child. The cost is affected by the quality of child the parents choose to have, but can be reduced by the value of labour inputs of the child prior to formal entry into the labour market.

If the net absolute cost of the marginal child (to the parents) exceeds his contribution to family income, future family income (S_j) is likely to be retarded by large family sizes since the family's ability to accumulate physical and human capital is reduced. But in developing countries, the contribution of the child to production at an early age, and the positive effect of the marginal child on parents' productivity and indeed, the non-monetary satisfactions of raising children make the final calculus less clear. The question that may be crucial for parents may not be, as much of the literature has emphasised, whether the additional child is *ever* an economic asset, but under what conditions it is a liability.

(2) Education and Income: The production of Income Inequalities

The second major cost of children which determines the quality-quantity tradeoff, comes under the general heading of parental investments in the human and social capital of their children. Of the investments in human capital, expenditure on education is seen by parents as a major component.

Of course, once education is treated as a major investment in human capital or 'quality' of children, it chronologically enters the

empiricists' line of vision in terms of tests of the income effect of these investments. The relatively easy measurement of increments to education, compared with other human capital investments such as health, nutrition and on-the-job training, and its observable correlation with income, has permitted a great deal of empirical work seeking to measure its independent effect on earned income. More often than not, such analyses have involved testing the validity of equation (8) above, which posits a direct relationship between human capital (and other parental transfers) and earned income.

Testing this function and the income effect of increments to human capital, especially education, has however, brought its own problems. As a description of the process of production, the formulation of either equation (8) or equation (12) leaves much to be desired. The form implies that the impact on adult wealth of an incremental unit of a given input does not depend on how much of that input is utilized, nor does the effect depend on how much of other inputs are used. But if βX_j and $\phi \omega_j G_j$ are related to each other as are the social characteristics of children and parental investments in children, then the effects of each on I_j may not be cumulative or independently measurable, and the variables may share a certain amount of explanatory power which is common to both of them.

Several authors (including DeTray, 1976) have argued that a major link between fertility and education investment in children is through the effect of parental education on the ability of couples to invest in their children.⁹ In its simplest form, the argument is that the more highly educated parents are (and therefore the higher their

9. De Tray, 1976 "Population Growth and Educational Policies: An Economic Perspective" in *Population and Development* edited by Ronald G. Ridker, John Hopkins University Press, Baltimore and London, 1976.

social and human capital) the more efficient and effective they are at investing in the human capital of their children during pre-school years (and, of course, the higher their own income). The increased efficiency of parents reduces the relative price of early investments in children, which in turn increases their propensity to invest in their children's human capital: β . The picture may be extended by recognising that early investments in children are likely to be complementary to the social capital inherited by them. That is, a positive association is expected between human capital investments in children (H_j) and social capital inheritances (G_j). Although the language may be different, this relationship between certain characteristics of parents and the characteristics of their children is a relatively old one to both social scientists and policy makers. The work of P.M.Blau, O.D.Duncan, B.Duncan, D.L.Featherman and others on occupational mobility between generations is in this vein and reflects a recognition that some children arrive in the labour market with a considerable handicap with regard to their accumulated investments in 'social' capital, thus reducing their actual returns to human capital investments, and their propensity to invest in human capital (education) in succeeding generations.¹⁰

One implication of the complementary relationship between H_j and G_j lies in the fact that if the model is correct in assuming that parents see education primarily as an investment good, and if, moreover, such investments are wholly or almost wholly, financed by parents attempting to maximise future family income (S_j) then empirically found differences in educational investments between siblings should

10. Blau, P.M. and Duncan, O.D. *American Occupational Structures*. New York: Wiley, 1967; Glass, David *Social Mobility in Britain*. Glencoe Press, 1957.

reflect parental expectations of the income-generating capacity of each child, and incidentally, parental acceptance of market constraints.

If, for example, parents find that the private rates of return to educational investment in females is lower than that of males (perhaps because of differences in remuneration in the market) the model predicts that income-maximising parents would invest more in the human capital components of their male children, for in doing so, they would maximise future family income. Only if equity were to be a strong element in the utility function of parents, would they act to compensate for or reduce inequalities in educational investments between siblings of different genders. The contribution of parents to income inequalities among their children is, of course, an important point which we shall take up further in the subsequent section. For the present it is only necessary to emphasise that the model predicts that investment in education would match the distribution of endowments between individuals. And if these endowments are asymmetrically distributed, the better endowed would retain some of their advantage and it might even be reinforced by parents.

The model's hypotheses regarding parental preferences, their behaviour in allocating human capital investments efficiently and equitably between their children, and inequalities in adult income resulting from such redistribution takes us into topics which are central to the concern of economists in less developed countries, and for which no coherent framework has so far emerged. The theory of human capital, demand for children and intergenerational income transfers are all integrated to deal with the role of families in equalising or spreading income distribution.

Since the contribution of parental behaviour to inequalities in adult income is so important to the empirical work in later chapters of this thesis, it is worthwhile dwelling for the rest of this chapter on the subject:

If we continue to assume that the decision-makers are parents attempting to maximise future earned wealth of their family, there are two potentially important sources of measurable earnings inequality determined by parental behaviour. They can be divided thus:

- (a) income inequalities caused by differences in the distribution of endowments and investments between siblings in a single family; and
- (b) income inequalities caused by net differences between families in their overall accumulation of human and social capital stock over time.

The first of these causes inequalities within a single generation, while the second is responsible for income inequalities between generations. Let us discuss each of these in turn.

(a) Differences in Human Capital Investments between Siblings

Parents divide resources between numbers of children and make investments in children on the basis of the relative expensiveness of each component in generating income. Parents will determine absolute levels of investment in each child depending upon its expected rate of return to human capital. And parents have the option of compensating for or reinforcing differences in their children's natural endowments, depending upon whether they are attempting to maximise efficiency or equity in their utility function.

A strong and compelling argument has been made in the literature that large families bring a conflict between the efficiency considerations derived from the desire to maximise family income and considerations of equity between siblings - a conflict which parents with fixed resources can only resolve (it is hypothesised) by reducing the number of children they have and spreading human capital resources equally between fewer children.¹¹ But there are three aspects to this trade-off between efficiency and equity which must be mentioned, insofar as they relate to inequalities in adult income.

The first aspect has already been mentioned earlier: If parents regard all their children symmetrically in their utility functions, and the rates of return to human capital are constant both over time and with additional investments, differences between children in their natural endowments (and therefore in their expected rates of return to human capital investments) will permit parents to contribute to earnings inequality between their children by favouring the more able and compensating the relative disadvantaged children.¹²

The second source of inequality in earning potential between siblings arises because rates of return to human capital are neither constant in perpetuity (and are therefore different for each additional child) nor are they constant with increments to schooling. The assumption in much of the literature is that the rates of return to human capital are 'initially higher than on other assets and decline as more is invested' making human capital the first channel for investment in children.¹³ If this assumption of declining private rates

11. Gary S. Becker, *A Treatise on the Family*, Cambridge, Mass.: Harvard University Press, 1981.

12. Gary S. Becker, *A Treatise on the Family*, Chapter 6.

13. Yoram Ben-Porath, "Economics and the Family - Match or Mismatch? A Review of Becker's *A Treatise on the Family*" *Journal of Economic Literature*, Vol 20. (March 1982) pp.52-64

of return to human capital is empirically endorsed, and it has been in many western and developing countries,¹⁴ then the important implication of this phenomena is that parents will want to invest equal amounts in each child they have (thereby maximising their returns to their investments) and this in turn implies that the observed relationship between income and fertility could be negative even if the 'true' income effect were positive- holding wages and the prices of market goods constant.

Empirically, the finding of declining (or equal) private rates of return to increments in schooling arises from the fact that most educational costs at the lowest (primary) level of education are provided by the State, and hence are relatively cheap to the family. Indeed, in those countries where the law requires a high level of compulsory education, the State normally takes upon itself the bulk of the financial burden of schooling at the primary and secondary level. Thus private rates of return to investment in schooling may be quite high until the termination of secondary school, tending to decline thereafter as the private (direct and indirect) costs of education rise.

But in those countries with no compulsory education, or where the State chooses to undertake a smaller proportion of the true costs of primary and secondary education and a greater proportion of the costs of higher and tertiary education, the computed private rates of return to incremental schooling may be constant or rising, depending upon the division of financial responsibility between the family and the State at each level of education.

14. Psacharopoulos, George and Hinchliffe, Keith *Returns to Education: An International comparison*. Amsterdam: Elsevier Scientific; San Francisco: Jossey-Bass, 1973.

The point here being made is that *rising* rates of return to incremental education have different implications for the allocation of parental resources between siblings, compared to the effects of *declining* rates of return. In the former instance, maximisation of income returns will not necessarily occur if parents reduce family sizes and equalise educational investments between offspring. It is more likely to occur if parents distribute their investment resources asymmetrically between their children, favouring the first-born siblings at the expense of their middle-born or youngest children. This asymmetrical distribution of resources between siblings would allow parents both to increase the probability that one of their elder-born children will prove to be an outstanding success in the urban sphere, and to maximise their income at an earlier date. Indeed, if parents can fully (or almost fully) control the income returns from their investments in their children, maximisation of income at an early date may be an important aspect of their utility function. For it will mean that they will be able to compensate those siblings disadvantaged in their human capital investments, or at least ensure that such siblings are compensated during their own lifetime. Rising rates of return to education may serve to emphasise the efficiency of this decision. Once again, the exact asymmetry of resource allocation between siblings will, of course, depend upon each child's raw capital and therefore the probability that the child will complete the required amount of education and thereafter migrate to acquire employment in the formal sector.

Rising rates of return to education also mean that the price effect of the additional child is not the same as in countries where these rates of return decline; the expected trade-offs between quantity and

quality of children may not materialise or at least be delayed as long as parents can control the income returns from investments in their children. One of the important constraints in the model - and it must be remembered that the model is held to apply to the western nuclear family - is the parental budget constraint which limits parental resources to parental labour earnings or non-labour income from property.

But this constraint does not adequately describe the position of parents in developing countries. One essential difference between the position of parents in the western world and those of parents in rural countries like Kenya, lies in the balance of power relationships between the generations. Although the control of western parents over their non-adult children are considerable, they have no legal rights over their children once the latter reach the age of majority, and very little scope for controlling their behaviour towards themselves, except through ties of affection. A father or family with considerable property to bequeath may be able to secure a degree of compliance with his wishes, but he can hardly expect his children to labour totally on his behalf without recompense until his death. In contrast, the traditional African father is master over his children whether they are adult or not. Among tribes where it is not customary to give male-born children access to land prior to the death of the preceding generation, he fully controls the surplus produced by the labour of his sons. This, of course, means that the parental distinction between maximising parental lifetime income and future family income may be quite small; in either case, parents would have complete control over the generation and redistribution of income, whether or not such income were to be earned by themselves or their children.

Evidently, the larger the household the tribesman heads, the larger the available labour force, and the larger the possible surplus available for raising the standard of living and displaying power within the family. Indeed, in such gerontocracies, the father's authority comes from the number of his children and the authority which he can command over them. The ability to utilise the labour power of his children and the prestige attached to a large family gives fathers a strong incentive to maximise the number of his descendants and the total product of their labour. It also means, of course, that parents wishing to maximise their utility - which in this case may incorporate income and prestige components - may not perceive any conflict between efficiency and equity in the sense hypothesised by the model.

These parents who can expect to fully control the labour income of their offspring, and who are making decisions in a market where *rising* rates of return to education exist, would choose to favour their first-born children with educational investments secure in the knowledge that in the j th year the family pool of investment income would begin to increase from the generation of child labour income. Younger siblings who are of school-going ages in that year (and thereafter) may suffer no disadvantage, for parents may be able to invest part of the increased pool of income in the education of such younger offspring, compensating the middle-born children in non-human assets.

There is finally, one last aspect to the the parental trade off between efficiency and equity which must be mentioned. One of the advances in economic analyses in the model is the treatment of

the household as a maximiser of utility in consumption and in determining the allocation of human time and goods with respect to household production.

Consider, once again, the position of the head of household in a smallholding in rural Kenya, and assume that he fully controls the labour product of his children. One of the efficiency considerations derived from the desire to maximise family income is the fact that part of the pool of family labour must be retained for own-agricultural production. Equalising investment in schooling between children will only be efficient in terms of maximising future family income if such investment has a positive effect upon the labour product even of those children who do not migrate but are induced by parents to stay on the farm and contribute their labour to home-agricultural production.

A general feature of all peasant farming in Kenya is that women work in agriculture with all crops and with all the work processes of cultivation. The other main characteristic is that cattle and cash-crop farming are the responsibility of men. It does not matter whether the cash crop is an export crop or a food crop. Even if the man is absent from the farm he will tend to be perceived in the work of tending the crops. The wife, however, is usually the main labourer on the cash-crop area, together with children above 8 years of age. Child labour may be limited because of conflicts with school attendance. In all peasant farms, family labour is the essential part of labour input in agriculture. The labour may be supplemented by communal labour (work groups) assistance from relatives and

15. Mette Mønsted, "The Changing Division of Labour within Rural Families in Kenya" in John Caldwell (ed) *The Persistence of high Fertility: Population Prospects in the Third World* (2 vols) p 259-312 1972.

hired labour, but the basis is family labour.

Smallholder parents are therefore at an enormous advantage if some of their children can add their labour into farming at a time when the burden of more onerous tasks of production become too great for them. And this means that they will not make substantial educational investments in some children if this behaviour (lack of investments) increases the probability that such children will remain on the farm rather than be released into the formal labour market.

Thus, for a given resource allocation, parental alternatives may not merely be between a relatively large number of children with relatively low potential income, and fewer children with relatively high potential earnings from education. Depending upon the rates of return to education relative to the income returns from farm production (and the psychic utility of some children staying on the farm) parents will want to distribute their resources between their children so as to maximise total family income, whether it is from farm or non-farm activities. If educational investment in those children who reached adulthood at a time when parents were unable to carry out the burden of farm production tasks themselves resulted in their migration off the farm into non-farm jobs, (thereby increasing the need for hired farm labour) then the inducement to invest asymmetrically between children may be quite high, even in small families. This may account for the finding among the Akamba of Kenya that only one (of a few) siblings from a given family will be sent to school.¹⁶ Presumably, as before, the exact disposition

16. Tarsis Kabwegwere "Determinants of Fertility: A discussion of Change in the Family among the Akamba of Kenya" in John Caldwell (ed) *The Persistence of high Fertility: Population Prospects in the Third World*. (2 vols) pp.189-222. Australian National University Press, 1972.

of human capital resources between children will depend not only on rates of return to education, but also on the sex-composition of children in different age groups, on the mental and physical health of children, deviations between expected and actual attributes of children and on the flow of family investment resources and relative ages of parents and their children.

An important aspect of human capital theory - which is embodied in the model - rests on the proposition that investment in such capital will raise productive stocks of labour which provide earnings over future periods. It is becoming very clear in developing countries that children are the poor man's capital if they contribute to the welfare of the parents from urban earnings, and by providing their parents with food and shelter and farm-labour at a time when they are no longer able to provide these for themselves. The total number of children and the allocation of investments between such children may be such as would enable the parents to offset the risks of not obtaining an income from either source.

(b) Differences between Families in Intergenerational Capital Transfers

In the last section we dealt with inequalities in income earning opportunities *within* families and therefore within generations. In this section we deal with differences in the accumulation of income *between* families, resulting from different family proclivities to invest in their offspring.

Different families have different utility functions, parental incomes, average 'raw' endowments, rates of return and inheritances of social capital because of differences between families in talents, motivation and opportunities. Indeed, these different capacities of families

and their varying efficiencies in performing their functions of income generation and redistribution allow them to play a major role in the intergenerational transmission of inequality, limiting the ability of public policy to alter the existing social order.

Nevertheless, until a few years ago,¹⁷ research tradition examined the role of the family in producing and perpetuating inequalities between generations solely in terms of inherited material wealth transfers from one generation to another.¹⁸ Leaving sociologists to emphasise the role played by the characteristics or socioeconomic status of an individual's forebears in the determination of his career through their influence on his background.¹⁹ Recent theoretical developments expressed in equations (8) and (12) above have made possible an unified approach to intergenerational income mobility and inequality by integrating financial, social and human capital transfers from parents to children into a single theoretical framework. Social wealth transfers in their widest sense are held to include the effects of background, cultural and biological inheritances of children from their forebears. And, by suggesting that family income is determined by substitutable and simultaneously determined transfers of wealth between generations, economic models of family behaviour have unified the various approaches to the intergenerational distribution of income.²⁰ The argument is, of course, that the income of children

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17. Gary S. Becker, "A Theory of Social Interactions" *Journal of Political Economy*, 82 (Nov/Dec 1974):1063-93
18. Josiah C. Stamp, "Inheritance as an Economic Factor", *Economic Journal*, 36 (Sept. 1926):339-74; Conin D. Harbury & D.M.W.N. Hitchens, *Inheritance and Wealth Inequality in Britain*, London: Allen & Unwin, 1979; Paul L. Menchik, "Inter-generational Transmission of Inequality: An Empirical Study of Wealth Mobility." *Economica* 46 (Nov. 1979): 349-62.
19. Blau P.M. and Duncan, O.D. *American Occupational Structures*. New York: Wiley, 1967; David Glass *Social Mobility in Britain*, Glencoe Press 1957.
20. Gary S. Becker & Nigel Tomes "Child Endowments and the Quantity and Quality of Children" *Journal of Political Economy* 84, no. 4, pt. 2 (August 1976) S143-S162; Ishikawa, Tsuneo "Family Structures and Family Values in the Theory of Income Distribution" *Journal of Political Economy* 83, no. 5 (Oct. 1975) 987-1008; Becker & Tomes "An Equilibrium

can be raised when they receive more human capital or social wealth transfers from their parents. Thus the fortunes of children might be linked and be traceable to that of their parents not only through human capital transfers, but through parental reinforcement of these bequests with larger or smaller bequests of 'social' capital. Each of these transfers could theoretically have an independent effect on income (see equation 12 above) within families, but might interact to affect the distribution of income within and between families. Certain families might socialise their children and develop non-cognitive skills which are largely independent of test scores and educational attainment, but still valuable to employers. If one accepts the notion that employers value these interpersonal skills, then parental traits which produce these skills might be correlated with income status.

Becker and Tomes²¹ have argued that primitive societies might rely heavily on this 'social' capital of family reputation and 'connections' in assessing various characteristics of individuals in the marketplace, because such societies might not have accurate methods of assessing these characteristics directly. Families and kinship groups then would have an incentive to maintain and enhance any reputation they might have initially acquired in the marketplace, by controlling and guiding the characteristics of their offspring in order to maximise their income benefits.

Some of the social capital transfers to children might yield only

contd.

Theory of the Distribution of Income and Intergenerational Mobility", *Journal of Political Economy*, 1979, vol.87. no.6; Nigel Tomes "The Family, Inheritance and the Intergenerational Transmission of Inequality" *Journal of Political Economy*, 89, no.5. (October 1981) 928-957.

21. Becker & Tomes "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility" *Journal of Political Economy*, 1979, vol.87. no.6.

long-term benefits and their value would therefore depend on parents correctly anticipating the future income benefits of current action. Suppose that the lifetime income of parents could be changed at the expense of or to the benefit of the incomes of future generations of the family. If parents have a low discount rate (i.e. they are attempting to maximise family income over present and future generations) then they would be prepared to forfeit an increase to their own income in the present if the income of succeeding family members were to be increased even more: they might choose to migrate to a city in which the short-term benefits on income to themselves were small (or even negative) compared with the income benefits to their children.

One final parameter in the equation developed by Becker & Tomes must be mentioned: the effect of market luck. The full equation argues that the equilibrium income of children is determined by their raw endowments, the human capital investments made in them by their parents, the inheritances of financial and social capital, and finally by their run of market luck. Market luck is described as transient fluctuations in production possibilities, prices of goods and factors of production occurring after human capital and social capital investments in children have already been made. With all families having the same utility functions, degrees of inheritability and rates of return to human capital investments, the unequal distribution of income in any generation would depend on the incidence of market luck between families in that generation and indeed on the distribution of market luck in previous generations. Imperfectly anticipated market market disturbances would increase the variability in family incomes and parents might not be able to offset the bad market luck of their

children with larger bequests. But the reinforcement of good market luck with larger 'raw' capital and larger investments in social and human capital would allow some families to obtain a higher than average family income.

With data on bequests and their division in human and non-human form for a cross-section of families, the level of human capital formation would vary among families because of differing discount rates, differences in resources available to each family for investment, different distributions of genetic endowments, numbers of children and different efficiencies of parents in producing the income-earning skills in their children.²² Capital market constraints represent inequalities of opportunities between households as regards human capital investments, because of the absence of collateral and the high cost of enforcing loan contracts. Human capital investments are often made directly, and are self-financed by parents. Moreover, different parents would have different utility functions and rates of return to human and social capital because of imperfections in the capital market and favouritism or differences between families in labour market opportunities. Greater parental efficiency in the production of children's human capital would reduce the cost of this mode of transfer. This would produce a substitution effect, increasing human capital investments and reducing financial (although not necessarily social) wealth transfers to children, and an income effect increasing parental consumption, financed by reduced material wealth transfers. And, of course, one might mention the fact that there might be differential tax treatments of human and financial bequests to children. Intergenerational transfers of human capital

22. Arlene Leibowitz "Home Investments in Children" *Journal of Political Economy* 82. no.2. pt.2 (Mar/Apr.1974) S111-S131.

are not usually taxed and are invariably subsidised, while financial bequests are often subject to progressive inheritance taxes.

An important factor determining the earnings of the family would be the balance between maximising parental lifetime income and maximising future family income. If a strong element in the parental utility function were the maximisation of income of living and unborn children, then the parental discount rate would be low, and total bequests to children would be larger than in families where parents merely wished to maximise their own lifetime income.

Even at a constant discount rate however, if parental bequests to children were a fixed proportion of parental income, the incomes of children would be similar to the incomes of their parents. Which is another way of saying that income inequalities in any generation (or the skewness in the distribution of income) is crucially dependent upon the propensity of parents to invest in their children: β and θ .

D. Empirical Use of the Model in Kenya

Previous use of the model in Kenya and elsewhere has focussed solely on the human capital aspects of the model, testing its prediction of a positive relation between education and earned income, and measuring social and private rates of return to different levels of education across the population.²³ This tendency to conceive of education as a single independent variable and examine its direct relation to income in Kenya, without relating it to other important influences, has severely restricted the fruitfulness of this type of exercise. Indeed, the major deficiency in

²³. Hans H. Thias & Martin Carnoy, Cost-Benefit Analysis in Education A Case Study of Kenya, IBRD, John Hopkins Press, London 1972.

this approach to education in Kenya has been that it concealed the more interesting and complex relationships and interactions within and between groups, especially ethnic groups, which influence the personal demand for education and the opportunities for earning income. Obtaining overall (Kenyan) private rates of return to education may be useful in reaffirming a link between education and earned income and in making international comparisons, but it does not say why some tribes are more educated than others or why some groups are underrepresented in urban occupations.

There is an important distinction between establishing a link between education and the size distribution of income, and asking whether there are other parameters, such as ethnic origin, which reinforce, maintain or reduce the income returns to schooling.

Suppose that Kenyan society consisted of families identical in all respects but in the hereditary endowments of race, and that the only form of investment in human capital was schooling. (Market prices of goods and factors of production are held constant). The adult wage distribution would then depend on the different values placed on the race-specific schooling levels and on the distribution of schooling attained by individuals of different races. The race-specific wage function might be:

$$W_{it} = w_{it} + r_{it}L_{Eit-1} \quad i = \text{race}$$

where wages are W_{it} in any generation t , L_{Eit-1} is the amount of schooling (in units of time) received by an individual of race i in the previous period and r_{it} is the market determined race-specific rental rate for a completed unit of schooling at time t , w_{it} is the race-specific market valuation of a person of race i with no schooling

at all. Wage inequality can unambiguously be represented by the ratio of race-specific wage rates: W_K for Kikuyu and W_L for Luo, and so on. If this ratio equalled zero for each level of education achieved, then the returns to investment in schooling would be identical for all racial groups. But if this ratio were to be significantly different for each ethnic group, then clearly the interaction between racial endowments and schooling would need to be explored further to identify their joint and independent effect upon income. At the very least, it would be necessary to establish whether there were differences in the ethnic rates of return to education.

The reasons for the existence of such differences in ethnic rates of return to schooling are many. Human capital theory embodied in the model argues that differences in rates of return to schooling arise because of different efficiencies of schools, differences in costs and benefits incurred by each ethnic group (x_{it}) and differences between (families) of different ethnic groups in their preferences for present over future income, variations in their efficiencies in producing income-earning skills in their children and so on. While it might be assumed that both Kikuyu and Luo parents would try to provide equal educational and employment resources for all their children, parents of one culture might be better able to transform these resources into high income, causing a skewed distribution in income between ethnic groups, changing their rates of return to education, and in turn causing variations in their rates of human capital formation in the next generation. One could usefully employ the model to explore the interactions between education and income within different tribal groups.

Some demographic aspects of the model might also be examined: raised expenditure on quality of children is predicted to raise the price

of numbers of children, generating an additional substitution effect away from quantity of children to quality per child. Empirically this would mean that we should find that those individuals (or groups) with the highest investments in human capital would come from the smallest families, and *vice versa*. To what extent, however, would rising rates of return to education contribute to asymmetrical educational investments between siblings and offset the predicted tradeoff between quantity and quality of children?

There was another section of the model which bore empirical testing: the model of intergenerational transfers. Our specific interest in elements of change in Kenyan society would allow us to examine the degree of intergenerational income mobility which was exhibited in the economy, and therefore the extent to which there would be 'equal income opportunity' for children whose economic origins were dissimilar.

In measuring such mobility in the economy, we could control for at least two parameters: human capital transfers, and social capital bequests. In most societies, all the variables which come under the general umbrella of 'social capital' are difficult to empirically measure even when one has control over the acquisition of data. But in Kenya, as perhaps in a number of societies where economic, social and religious influences are deeply interwoven with racial culture, alliance with any one kinship group could be held to represent the social capital of an individual.

Finally, we must mention that we could use the model to guide our inquiry into changing patterns of income mobility over time. The tendency in previous surveys, has been to conceive of mobility

as a fixed variable describing the sequence of change in income
(or occupation) between fathers and sons in the year of survey.
Far more interesting to us was a comparison of mobility over time:
mobility in 1968 compared with mobility in 1980. This comparison
would hopefully stimulate insights and speculation about variations
in economic conditions during the intervening years which had
produced the differences in mobility patterns, and we felt that
such a comparison would provide valuable information about future
trends in income distribution.

CHAPTER THREE

RATES OF RETURN TO EDUCATION

A. Introduction

It has long been observed in Kenya that completed education is an important factor determining earnings and that a rise in and redistribution of education among the workforce might be used to promote increases in real wealth.

In this chapter we attempt to show that although investment in education has positively affected income, the returns to such investment are different not only at each completed level of education, but significantly, they are different within and between ethnic groups.

We begin our first analytical chapter of this thesis with a study of rates of return to education for three reasons. Firstly, it is in keeping with the traditional human capital approach to inequality in earnings. Secondly, a full analysis of the effects of education on income distribution should include both the inequality in income effects between people in the same generation and between different generations, and we are fortunate in being able to focus upon both - the first such analysis for a developing country. Lastly, in pointing out the sharp inequalities in the internal rates of return to education between ethnic groups we are able to develop the theme of unequal incentives, and therefore propensities, of races and groups of families to invest in the education of their offspring. This theme which reoccurs throughout this thesis is an important one, because it implies that maximising behaviour is not the same between races; families from some groups have higher

incentives to invest in education and those families with higher propensities will have higher future incomes from education, an interaction that raises inequality and skews the distribution of income to the right even if all other parameters are symmetrically distributed across races.

The analysis begins with a brief description of the data base, proceeds from a construction of age-earnings profiles to the computation of internal rates of return at different levels of education for 1980 and a comparison with rates of return for 1968. The drop in the rates between 1968 and 1980 is explained in terms of aggregate changes in demand and supply of labour. We conclude by focussing on the ethnic inequalities in rates of return to education.

B. The Data Base

This study makes use of cross-section urban formal individual earnings data collected in Kenya in a Labour Force Survey during 1980. Firms were randomly selected from an index of establishments embracing total formal employment in 1979; the sample was doubly stratified by size of enterprise (distinguishing among four size groupings) and by location (in three towns - Nairobi, Thika and Mombasa). The original design covered manufacturing, construction, commerce, transport storage and communication. Agriculture, forestry, hunting and fishing, mining and the public sector were excluded from the sample.

In principle, each employee of the 45 firms selected was appointed for interview. There were, however, three exceptions to this rule: first, an incomplete coverage of expatriate executive personnel who were often absent for business reasons, and whose formal earnings (following interview) could not be verified and were therefore eliminated from the sample; secondly there was an omission of employees on night-shift; third, regular unskilled employees on piece-rate wage scales were excluded.

Altogether 1447 employees were covered in the Survey. Information was obtained by direct interview with each employee and was recorded on questionnaires - a sample of which is reproduced in Appendix A. In the interests of accuracy, to facilitate the acquisition of secondary data, and to eliminate the language response and interpretation bias observed in the pilot study, each respondent could elect for interview in any of seven languages, among which were English, Kikuyu, Luo, Kamba and Swahili. Data was obtained on demographic background - age, sex, ethnic origin, birthplace, number of siblings, family size, marital status, number of children, history of migration - socioeconomic background - parents' literacy and occupation, respondent's occupational and educational history, union affiliation and land ownership. Data on salary and occupational background for each respondent was verified from personnel records within each firm subsequent to interview.

In addition to providing detailed information on earnings, family background, education and occupation, the Earnings Survey was

conducted as part of a larger investigation into the effects of an individual's background on learning ability and scholastic, occupational and earnings achievement. Independent of its value in representing the industrial wage population of 1980, the Survey also provided a base for comparison with the 1968 Labour Force Survey conducted by Hans Thias and Martin Carnoy for the World Bank ¹ thereby enriching knowledge of the extent to which education, occupation and income has changed during the two decades of the country's independence. Both surveys were random samples of the wage population in urban centres and therefore yield unbiased estimates for the total urban wage population.

C. Age-Earnings Profiles

Numerous studies have documented that earnings rise with age, and have hypothesised that this relationship will occur because people invest in education and in general on-the-job training, thereby increasing their productive value to the employer. As such investment increases with education achieved, an age-income profile could initially lie below the profile of those in the next highest education level, but rise more steeply. Moreover, the earnings profile of an 'investor' will intersect the profile of a non-investor alike in all other capacities after no more than $1/r$ years, where r is the rate of return on investments in on-the-job training.

An alternative explanation for the rise in the age-earnings profile is that inherent difficulties in measuring individual

1. Hans H. Thias & Martin Carnoy, Cost-Benefit Analysis in Education A Case Study of Kenya, IBRD, John Hopkins Press, London 1972.

Their survey included an sample of public sector employees, which our 1980 Survey did not.

productivity lead firms to engage continually in a sorting and monitoring process based on performance on-the-job. Since initially firms would not have much knowledge on individual productive potential, starting salaries would not necessarily correspond with education or ability, but as long as successful performance on-the-job is dependent upon or correlated with (education and) ability, then over time, individuals with more (education and) ability will be promoted more quickly and consequently realise higher incomes than their less able or educated counterparts. In this instance earnings would be interpreted as the returns to ability or greater productivity - although it would not be clear whether this greater productivity was contributed to by incremental investments in education.

There are, of course, several additional reasons for incremental changes in the education component of income over time. Firstly, the dynamics of supply and demand for different categories of labour continually change relative wage rates: scarce, highly-skilled labour categories will more easily command higher remuneration, a combination of their expected higher productivity and lower elasticity of substitution as a factor of production. In addition, inflation alters the monetary values of the coefficients to education and therefore the perceived rates of return to different schooling levels, although not necessarily the true differentials between education groups. Thirdly, there may be a distributed lag effect in view of the probability that the rates of age-depreciation of human capital stock are greater for manual occupations which require less education than for non-manual skills. Fourthly, differential returns to training on-the-job within occupational

groups may adjust the rate of substitution between investment in education and other investments and hence indirectly affect the speed at which income increases over time.

In Table 3.1 below, various points on the age-income profiles for different educational levels have been calculated and these profiles are graphically presented in Figure 3.1. Regressions were estimated separately for different schooling groups and dummy variables were used for age categories to capture any non-linear effects of the relationship.

Table 3.1: Unadjusted Age-Earnings Profiles, by years of Schooling, 1980

Age Categories (Years)	Completed Education (Years)							
	0	1-4	5-6	7	8-10	11	13-14	14+
Under 19	-	-	-	801	387	1051	1600	-
20-24	559	620	592	802	557	1032	1826	3602
25-29	712	581	583	736	975	1529	2264	5218
30-34	794	703	702	905	1408	2859	3269	7908
35-39	638	988	713	1015	1237	2099	3811	
40-44	831	792	1152	794	1727	2099	3811	
45-49	754	809	1041	2014	2153		8716	
Over 50	840	771	1041	1521	1677		4500	

Source: Labour Force Survey, 1980

Regarding the general shape of each profile it is found that since educational investments are concentrated at younger ages, and continue at a diminishing rate through life, earnings - which are hypothesised to be a return on cumulated net investments - also rise, but at a diminishing rate over the working life, and begin to decline when net investments become negative. The rate of growth of earnings is therefore a positive function of the amount invested and of the rate of return.

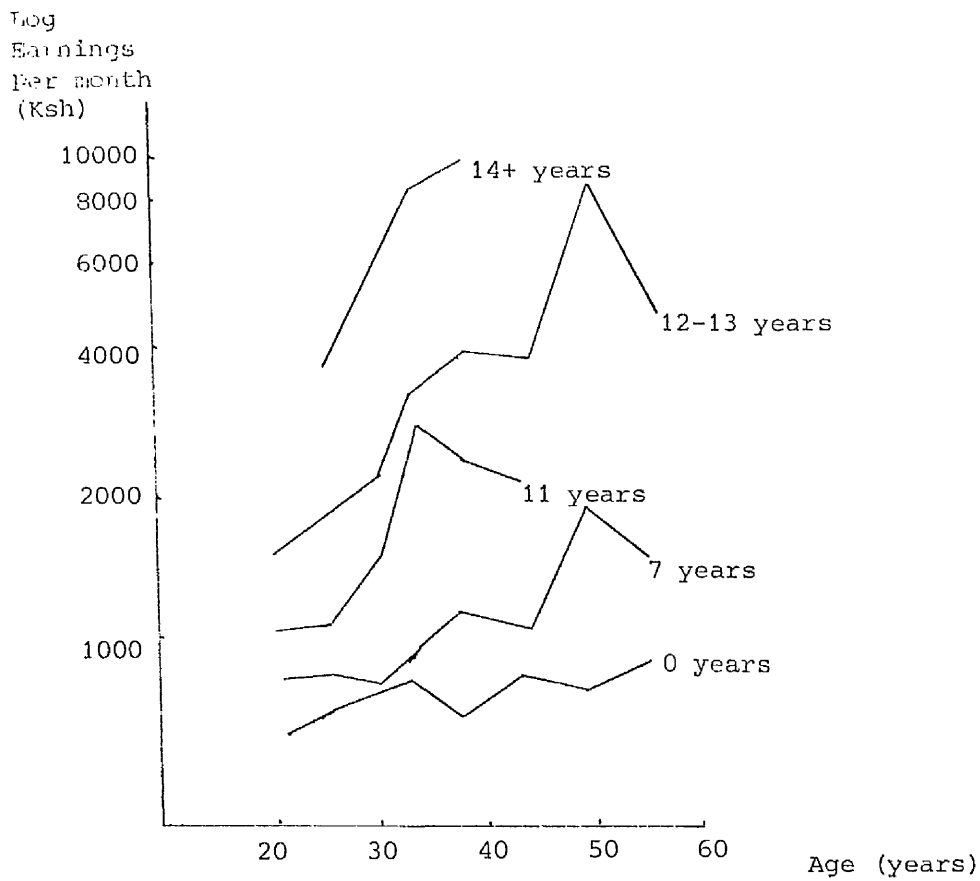


Figure 3.1 : Unadjusted age-earnings profile, by years of schooling, 1980

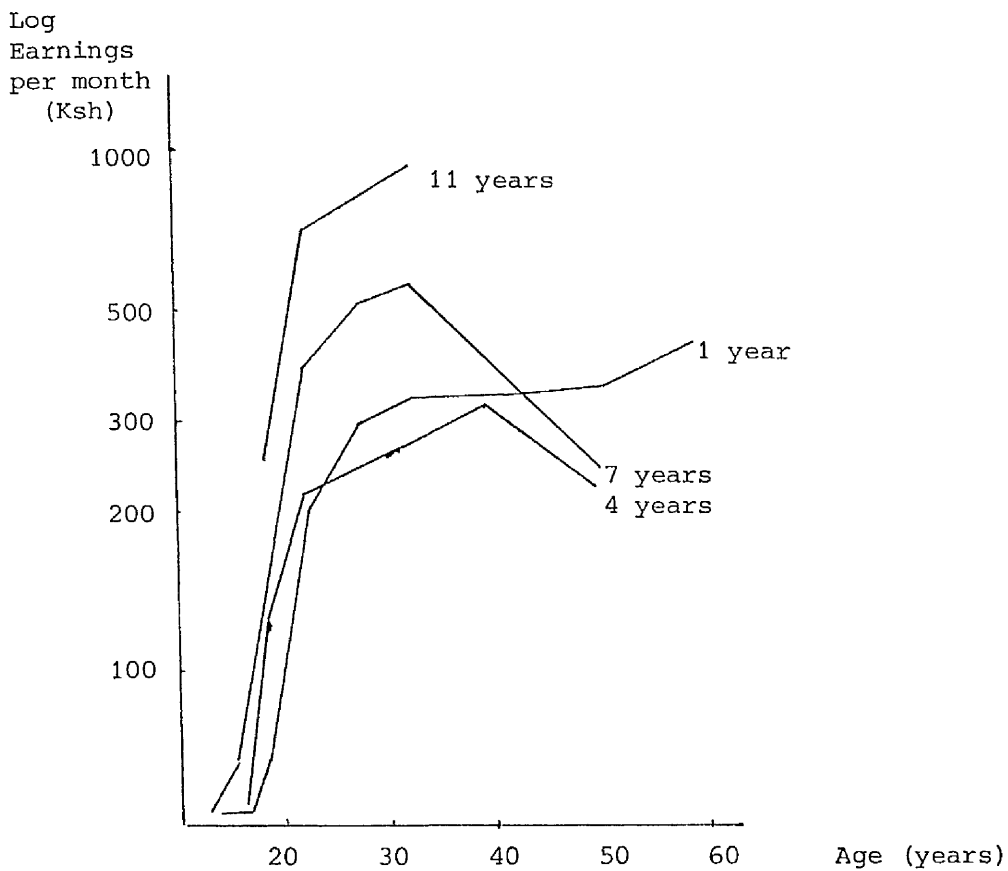


Figure 3.2 : Unadjusted age-earnings profile, african males, by years of schooling, 1968

The rates of increase in earnings are clearly different, however, for each education category. A proposition widely accepted in the human capital literature is that the higher the education level, the lower the rate of return.² In general this hypothesis is not borne out by our results. Thus, the no-schooling profile rises less rapidly than all the others and the growth rate of income with schooling reaches its peak among individuals with some University education.

Another important feature of the profiles is that the derived slopes for earnings are biased downwards: strong secular trends in schooling achievement obtain an older age profile within the lower schooling groups. Consequently, the negative age-education connection implicit within the equation biases the earnings differentials between the schooling groups downwards. This phenomenon would be true whether time-series or cross-section data were to be used, although in the latter instance, the depression of observed earnings in the later years of the life-cycle is exaggerated in a manner that does not truly reflect actual earnings over a typical individual's lifetime.

Direct observation suggests that each age cohort entering the labour market has its own distinctive pattern of responding to qualitative and quantitative changes in the supply of education, which response subsequently influences its earnings distribution. For example, the level of educational and earnings attainment of

2. See Gary S. Becker, A Treatise on the Family. Chicago: Univ. Chicago Press, 1981. Chapter 6.

individuals aged 35-45 in 1980 was substantially different from that of individuals aged 25-35 in the same year, not only because of age differences, but also because the two age cohorts were confronted with and had responded to different educational schedules, employment opportunities and patterns of remuneration when entering school and the labour force. Hence, the earning potential for an individual within one age cohort is likely to have been quite different from that of an individual within another age-cohort and since the profiles obtained in Figure 3.1 are a composite of earnings experiences of different cohorts, the slopes obtain a disjointed effect.

Ideally, it would have been desirable to obtain age-income profiles and measure rates of return to investment in schooling by examining the changes in income of an individual throughout his particular generation. The study would take as the starting point the birth year and trace investments in knowledge and education throughout the active life of the individual. Applying this method to successive cohorts would yield a series of comparable status profiles, showing both the nature of intra-generation movement and its end result in the final earnings distribution of the cohorts. Instead, the intra and intergenerational succession of cohorts which become the source of data in cross-section analyses obtain static rather than dynamic profiles and a translation into time specificity is always inexact.

Substance to this view is lent by an examination of and comparison with the age-earnings schedules obtained by Thias and Carnoy in 1968 and shown in Figure 3.2. A comparison of the two sets of schedules reflects the dramatic increases in the level of real and money wage rates, in the level of schooling attainment and in the differential earnings between schooling groups over time. Of immediate interest are the high and increasing rates of return to incremental schooling that prevailed at the time of the previous survey.

Looking only at the profiles for 1968 in Figure 3.2, without making a comparison with 1980, it would appear that the regression slopes to succeeding levels of schooling were extremely steep - almost vertical - during the period immediately following entry into the labour force, but they clearly tapered quite quickly after entry. The steep sections of the profiles reflect the experiences of workers who were between ages 17-23 in 1968 - workers who were in fact very recent entrants into the urban labour market and who, entering as they did so soon after independence in 1963, were subject to labour market conditions which were unusual and were unlikely to ever occur again.

The post-independence phase was special in that it was marked by the rapid Africanisation of jobs previously held by European and Asian personnel and by the once-and-for-all removal of barriers restricting entry and equalising payment to Africans in the occupational structure - which conditions would have stimulated a rapid rise in earnings for new labour entrants. The older-aged cohorts who were already part of the labour force prior to independence, and those cohorts whose level of completed education was comparatively low, were not subject to this almost vertical

increase in earnings, although they probably experienced a high degree of upward mobility from the occupations in which they had begun their careers, and these experiences are reflected in the flatter profiles for persons over the age of 23 in Figure 3.2 .

By 1980, however, at the time of the later Survey, conditions in the labour market had stabilised; new employment for less educated labour and for persons in clerical and administrative grades had become restricted. Consequently, by 1980 the profiles obtained at each educational level had flattened out for the younger age groups. Those individuals who had obtained markedly steep profiles in 1968 were, of course, part of the labour force being sampled in 1980, although by now the only evidence of their unusual experiences is given by the slightly steeper slope to each profile for the age group 29-34 years in Figure 3.1 .

As each labour cohort entering the labour market aged, it was replaced (in a sense) by succeeding cohorts, while itself undergoing change in terms of occupation, remuneration and length of experience. Thus, 1968 entrants and occupants of the labour force, advantaged as they were by increasing demands for wage labour and high rates of return to the low absolute levels of education they had attained, were replaced and joined by a new set of entrants into the labour force, who, having responded to the earlier high rates of return to education, and motivated to achieve at least secondary school, were faced in the late 1970's with wage and employment restraints and excessive competition at each level of skill, and consequently secured markedly different rates of return to those they had anticipated. These lower rates of return in 1980 are evidenced by a slower rate of growth of income (i.e. a flatter slope) in

1980 for all but the highest educated groups.³

So far we have attempted to emphasise the importance of using time-series data in deriving age-earnings profiles. But this is not the only source of bias. Conceptually the obstacle that subsumes all others is the potential bias due to omitted variables. For the figures in Table 3.1 implicitly argue that schooling is the only systematic force affecting income. But adult earning status may not be entirely determined by conscious and deliberate investments taken freely - that is in the absence of any constraints deriving from the circumstances of the individual's birth, rearing or occupational origins. Such a distilled theory of achievement does violence to reality inasmuch as the circumstances of an individual's birth might assign him unequivocally to a social and economic hierarchical status, which ascribed position may enhance or constrain the individual in his pursuit of the earnings achievement principle.

The strength and direction of these ascriptive forces must therefore be incorporated into the equation, although it is necessary to choose representative variables measuring social origins and job experience.

For analytical purposes, classification by father's occupation is normally convenient in the absence of precise or reliable data on economic status. By implication, such a measure of social origins hypothesises that occupational groupings encompass meaningful social groupings, that members of any one occupational grouping will tend to share life chances, social experiences and ambitions, and that

3. For the present we only wish to mention that the age-earnings slopes signal a drop in rates of return to all but the highest level of schooling. The underlying reasons are dealt with later on in this chapter.

the extent of upward mobility and career achievement will depend upon the level of social origins.

Classification of such origins by father's occupation, however, raises its own problems. Whereas the sample cohort represented actual groupings of individuals in 1980, the generation of fathers and the distribution of their occupations never truly existed at any one time. Many of these fathers pursued their cited occupations during 1980; in this instance they would, of course, be part of the labour force being sampled. Moreover, the character of the labour force in 1980 derived from the political and economic restructuring which occurred in Kenya during the previous two decades, which reordering - described later on in this chapter - stimulated the initial dispersion of manpower away from its wide recruitment base in subsistence agriculture towards various occupational destinations in the narrow but expanding urban wage employment sector. By 1980, the labour force represented both first and second generations of manpower: the former, older-aged category originated directly from agriculture, the latter, younger cohort had a higher than chance probability of descending from fathers already in urban wage occupations.⁴

We have already mentioned that some of the upward mobility for the younger generation resulted from educational improvements or investments which altered (mostly increased) the quality of manpower supplied - some of it allowing persons to make their way into occupations higher than their parents' because of their

4. We show the effects of father's occupation on son's earnings in the next chapter as well as in Chapters 6 and 7, where we deal more comprehensively with intergenerational mobility.

increased abilities - and some of it resulting from indirect repercussions of changes in demand occurring throughout this period -- for example the lowering of previously existing barriers to entry into occupations, with the result that educated workers from agricultural origins could supply labour to occupations previously barred.

Such employment conditions and opportunities would also have attracted labour of variant geographic and ethnic origins. Economic expansion, occurring as it did primarily in urban centres, encouraged a dominant stream of migration from proximate localities and a subsidiary stream of migrants from outlying areas towards the satisfaction of this urban employment demand. However, as Kenyan geographic location is highly correlated with ethnic grouping (See Figure 1.1 above) the pattern of migration would also have selectively affected the occupational and economic success of different ethnic groups within the various generations of migrating labour cohorts. The effect of tribe or ethnic origin would therefore need to be introduced into the equation.

For the sample as a whole, the extent of bias from omitted variables has been loosely explored in two steps - first by entering controls for socioeconomic origins, and then controlling for all variables - socioeconomic origins, ethnic grouping, employment experience and occupation. We present the result of these regressions on income in Figures 3.3 and 3.5 and Tables 3.2 and 3.3. (Figures 3.4 and 3.6 present the Thias-Carnoy results for 1968).

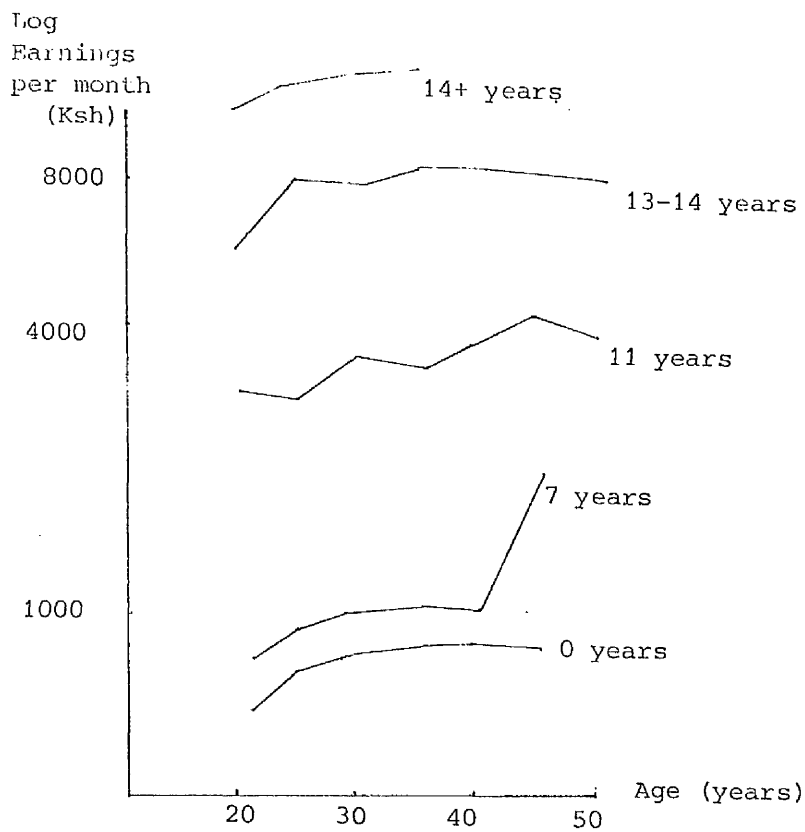


Figure 3.3 : Age-earnings profiles, by years of schooling, Adjusted for socio-economic status only, 1980.

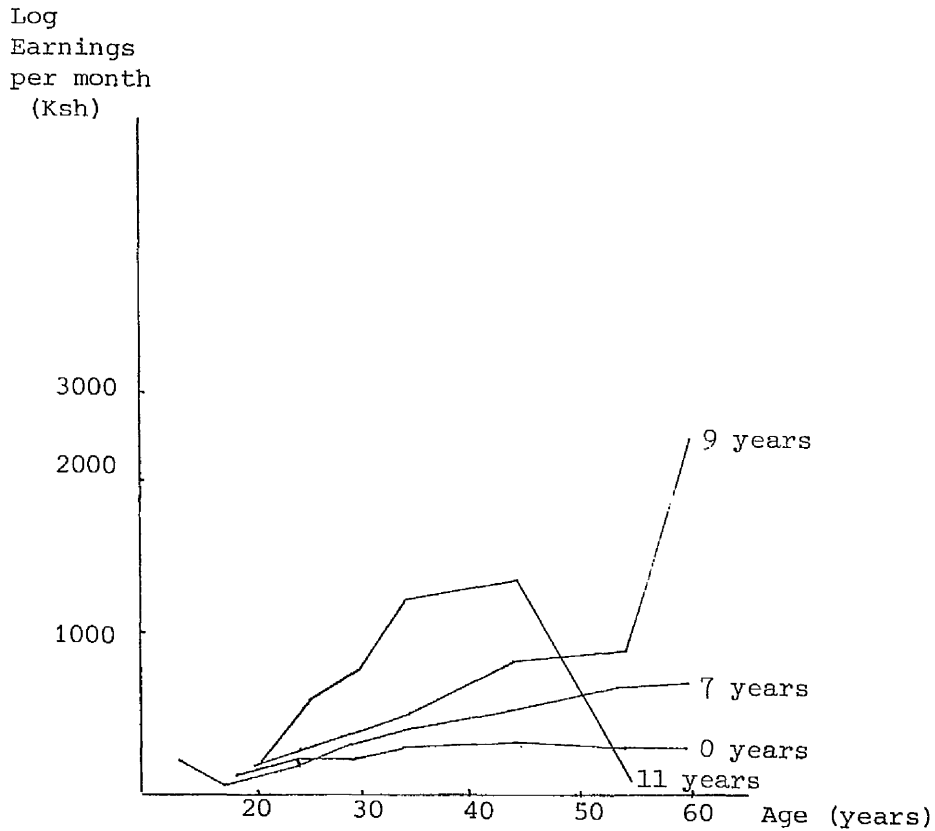


Figure 3.4 : Age-earnings profiles, by years of schooling, Adjusted for socioeconomic status only, 1968

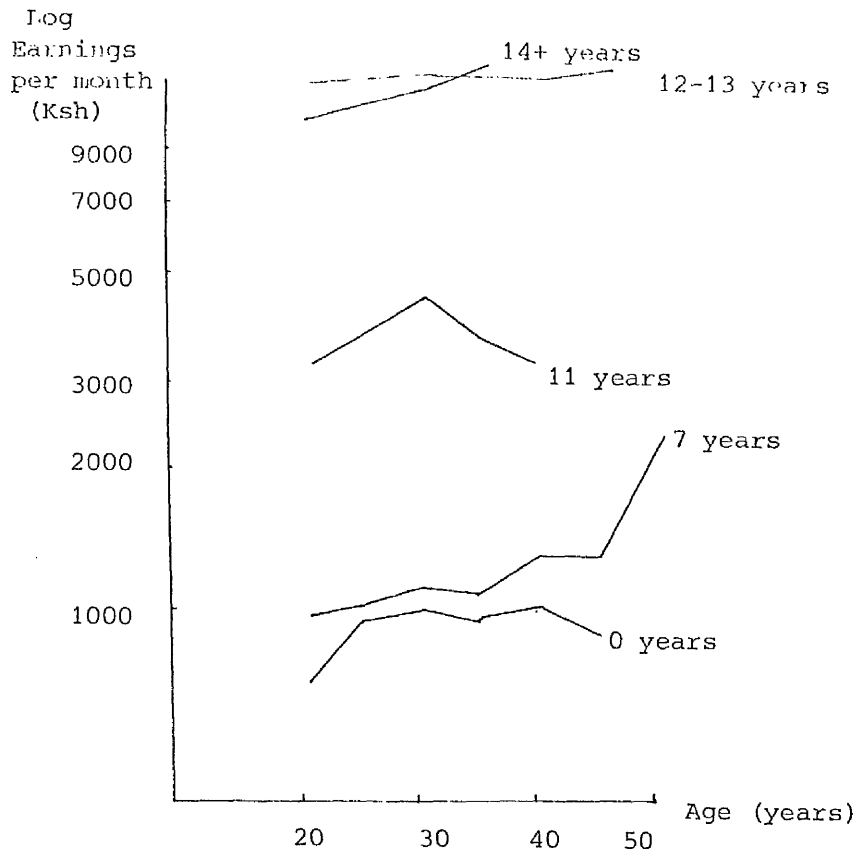


Figure 3.5: Age-Earnings profiles, by years of schooling, adjusted for all variables, 1980

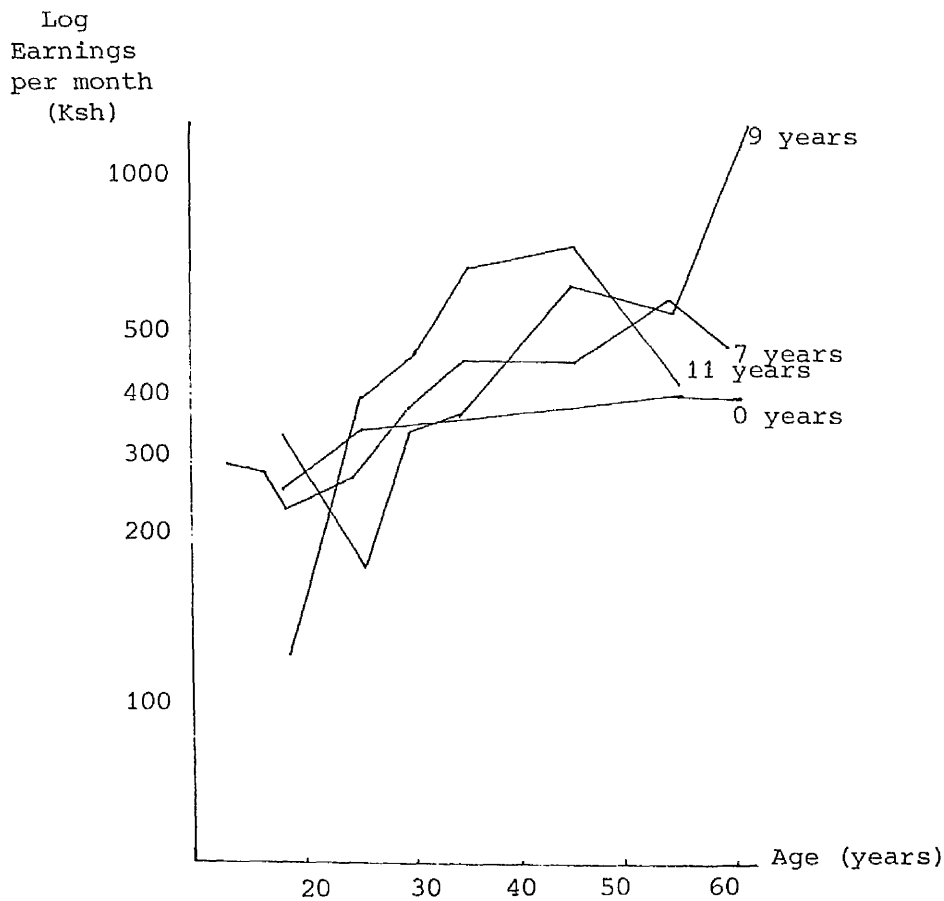


Figure 3.6: Age-Earnings profiles, by years of schooling, adjusted for all variables, 1968

Table 3.2 : Age Earnings Profiles, adjusted for father's occupation, father's education and mother's education.

Age Categories (years)	Completed Education - years							
	0	1-4	5-6	7	8-10	11	12-13	14+
Under 19	-	-	-	-	-	-	-	-
20-24	429	528	401	671	2352	2855	5524	11829
25-29	612	559	384	835	2700	3389	7654	13445
30-34	633	663	482	965	3201	4729	7420	16135
35-39	635	459	527	999	3180	4186	8134	17329
40-44	676	705	949	926	3544	3967	7888	
45-49	633	706	788	1994	3935		12519	
50+	-	-	-	-	3588		7969	

Source: Labour Force Survey, 1980

Table 3.3 : Age-Earnings Profiles, adjusted for all variables: father's education, mother's education, father's occupation, tribe, respondent's occupation, experience and firmtype.

Age Categories (years)	Completed Education - years							
	0	1-4	5-6	7	8-10	11	12-13	14+
20-24	648	759	646	1030	2118	3598	15451	11873
25-29	1013	817	581	1183	2126	4005	16540	13445
30-34	1104	887	612	1233	2473	4792	16961	16135
35-39	1006	1196	659	1169	2431	3967	18359	23431
40-44	1052	985	1002	1473	2816	3429	17036	
45-49	992	939	797	1578	2795		19549	
50+				2614	2727		18359	

Source: Labour Force Survey, 1980

It is evident from the profiles in Figures 3.3 and 3.5 that the adjusted profiles are flatter in shape (almost horizontal for the highest levels of education) than both the unadjusted profiles and than their counterparts in 1968. And it is also clear from these profiles that income obtained is always at a level absolutely higher than that attainable with a smaller amount of schooling.

There is, in effect, no period equivalent to Mincer's overtaking year - which to some extent was evident in 1968, and this finding suggests that schooling has become a non-substitutable commodity in the process of increasing the income of the Kenyan worker.⁵ It is a systematic force affecting income because typical worker value to the employer depends greatly upon it, and when socioeconomic, ethnic, employment and occupation variables are controlled for in the equation, it remains more or less constant until retirement.

D. Individual Rates of Return to Education

In exploring human capital investment decisions in education, it is often convenient to begin by deriving the rate of interest at which the present value of investing in human capital exactly equals the cost of doing so. The concept of rate of return, which involves a direct comparison of market earning power, is extremely useful because it permits the construction of a demand curve for investment in human capital, such a demand curve being the relationship between the rate of return on an additional investment (the marginal rate of return) and the amount of investment already undertaken.

With regard to education, this procedure can be used to estimate the profitability of investment in schooling; income streams of persons or groups of persons who differ in their levels of acquired education are compared. The rate of return, r is defined implicitly as

$$\sum_{j=1}^n X_j (1+r)^{-j} = \sum_{j=1}^n Y_j (1+r)^{-j}$$

where X , Y are alternative income streams, and the subscript j represents the year during which income is received. Regressions are

5. It was suggested to the author by Professor Mark Blaug of the Institute of Education, University of London, that Mincer's overtaking effect might be visible within education groups, and this has indeed proved to be the case.

estimated separately for different schooling groups and dummy variables are used, as before, for age categories to capture any non-linear effects of the relationship.

The costs for the individual consist primarily of earnings foregone while the individual is at school, and other direct school-related expenses. In Kenya, the pattern of financing for primary education divides responsibility between Central Government and the local community. In rural areas the burden of constructing and maintaining primary schools falls almost entirely and directly upon the shoulders of the parents of school children. In addition to this responsibility, there is the additional responsibility of constructing teachers' houses and supplying school equipment (furniture etc.) for the school. Local government now provides only recurrent operating expenses for teachers' salaries and for some school equipment at the primary level. Therefore, differences in the ability and willingness of communities to impose levies on themselves for such development costs have resulted in considerable diversity in the private costs of schooling between and within communities. Although we were fortunate in obtaining information on these costs from the Schooling Survey, 1980,⁶ differences in costs between families suggest that the computed rates of return at the primary level must be treated with some degree of caution. At the secondary and higher level, private costs consist of tuition fees and costs of school uniforms, books etc. To what extent these fees represent the true costs of running the schools is not known. What seems certain is that the Government bears a greater proportion of the financial responsibility of formal education from the secondary level

6. See page 276 for details.

on upwards, and that the divergence between private and social rates of return to education is likely to be greater at these levels than at the primary school level.

Foregone earnings were estimated from the data on urban earnings. It was, unfortunately, impossible to adequately measure indirect private costs of foregone earnings, which depend not only on the length of time involved in additional education, but would also be affected by the delay in finding work after finishing school. - a delay often related to the education and the urbanisation of the applicant. Urban dwellers find work more easily than rural or town migrants to the city, and the costs incurred are different for each category of worker.⁷

Table 3.4 below gives the private rates of return to various levels of schooling for 1980, based on the incremental income stream arising from education. The fact that these rates have been derived without accounting for costs arising from delays in finding employment means that they are biased upwards.

Table 3.4 : Average private rates of return to education, 1980 and 1968

	Completed Schooling (years)			
	Primary 7 yrs	Secondary 11 yrs	Higher 13 yrs	University 14+ yrs
Average 1980	10.0	19.4	19.6	35.0
Average 1968*	26.0	32.0	23.8	27.4
(N) 1980	(648)	(667)	(101)	(31)

Source: Labour Force Survey, 1980

* Note: rates are obtained from Thias-Carnoy survey in 1968, also corrected for socioeconomic background.

7. See page 221 Chapter 7 .

Table 3.4 clearly shows two effects: firstly it indicates that the rates of return to education *rose* with increments to schooling and secondly it shows that between the two surveys 1968 and 1980, the private rates of return fell for all but the highest level of schooling.

Let us deal with each of these conditions in turn. With regard to the rise in the rates of return to incremental education, we deal only with the rise in the rates of return to education between the primary and secondary levels of schooling. For the moment the reader is asked to ignore the rise in rates of return between higher and tertiary levels of education: it will be shown later that the rates at the University level of education apply predominantly to one ethnic group (the Kikuyu - see Table 3.10 below) and therefore reflect the particular labour market experiences of this group.

On the whole, the rise in private rates of return between the primary and secondary levels of education reflect both the high direct private costs of schooling at the primary level and the relatively low formal wage rewards for labour with such schooling, compared with labour having secondary or high school certificates. It has already been mentioned that at the primary school level all but recurrent teacher costs of schooling are borne directly by the parents of students .

At the secondary and higher levels of schooling, although the direct private costs of schooling are prohibitive for parents of a child, competition for a secondary (or high school) place is so fierce (possibly because it lowers the expected risk of being denied wage-employment in the formal sector.) that admission into a Government secondary maintained school enables the child to draw upon financial support

from his extended family. Moreover, as mentioned earlier, a greater proportion of the financial costs of running secondary schools is borne by the public sector.

With regard to the fall in the rates of return between 1968 and 1980 it is necessary to look at changes in the demand for and supply of educated labour in the formal sector during the period between the two surveys.

(1) Changes in Aggregate Labour Supply

The period 1968 to 1980 covers an important phase in the development of the formal labour economy. In terms of labour supply, there were two major developments which affected the formal sector: an increase in migration from rural to urban areas and an increase in the educational skills of labour supplied to industry.

We look at the impact of migration first. Economic expansion occurring as it did primarily in the monetary agricultural and industrial sectors of the economy, served to produce what were, in effect, inducements to the supply of educated labour in urban and non-farm occupations. But as the demand for rural agricultural labour declined, the natural increase of the farm population further and further outstripped replacement needs, while in contrast the natural population increase of urban areas lagged behind the demand for labour in the urban wage sector.

The differential increases in fertility rates between the rural areas and the metropolis can be highlighted from the following

table. Not only do the figures indicate that there was an absolute increase in population between 1969 and 1979, but urban-rural differences in fertility were clearly very large during both years.

Table 3.5: Relative Rates of Growth between the Metropolis and the Provinces, 1969 and 1978-9

Area	Population Totals		Total Fertility Rates	
	1969	1979	1969	1977-8
Nairobi - (urban)	509,286	827,775	5.5	6.1
Provinces - (rural)				
Central	1,675,647	2,345,833	8.7	8.6
Coast	944,082	1,342,794	5.6	7.2
Eastern	1,907,301	2,719,851	6.7	8.2
N.Eastern	245,757	373,787	n/a	n/a
Nyanza	2,122,045	2,643,956	5.6	7.9
Rift Valley	2,224,085	3,240,402	6.6	8.8
Western	1,328,298	1,832,663	8.6	8.3

Sources: Kenya Statistical Abstract, 1981
World Fertility Survey, Kenya.

Indeed, supplementary data suggest that women currently living in the metropolis had a total fertility rate which was 2.5 births lower than that of rural women, while the fertility rate of the non-metropolitan urban sector was intermediate. (The fact that this pattern persists for marital fertility, though in diminished form, implies that the rural-urban differences in total fertility have been caused by the combined effects of genuinely lower marital fertility and of delayed marriage in urban areas).

A second development in labour supply concerned the skill component of labour offered to the formal labour market. The high and increasing

private rates of return to education in the sixties - referred to earlier - and the expansionist educational policy of the Government, continuously and greatly improved the educational quality of labour cohorts coming on to the market during the seventies. The average education of an entrant to the market in 1980 was 11 years of schooling compared with 5.7 years in 1968.

But the dearth of opportunities for the employment of educated labour in agriculture, the incidence of high fertility in a contracting and moreover a low-wage sector of the economy, simultaneous with lower fertility in the expanding high-wage urban sector, created an upward push in the flow of educated manpower to urban areas. By 1980 the supply of labour to urban markets had increased both in volume and in terms of educational skills offered.

(2) Changes in Aggregate Demand for Labour

During the same period, however, there occurred a vital restructuring of industrial demand for labour, which reorganisation corresponded fairly closely with the cycles of economic growth occurring during the period. During the first phase (1968 - 1974) the economy followed the script originally written during the sixties; it utilised slack capacity generated in industry during the period of rapid expansion immediately following independence in 1963 and, moreover, obtained real productivity increases via improved technological inputs in agriculture. Industrial production continued to be based upon second-hand or dated, relatively labour-using vintages of capital equipment, and, accordingly the rate of employment growth accelerated from 3.4% per annum in 1969 to 8.5% per annum in 1974.

The early increases in the demand for labour occurred most substantially at the pinnacle of the occupational structure. Displacement of expatriate personnel in skilled white-collar, management and professional capacities, concurrent with the normal economic expansion following independence, stimulated a demand for replacement labour at rewards commensurate with expatriate rates; this demand against a background of scarce indigenous skilled personnel, permitted those labour groups positionally nearest the top of the occupational pyramid to move upward, occupy and profit from the expansion. Subsequently, the vacuum created by the ascent to new opportunities at the top, started a chain-reaction of upward short-distance movements which reverberated throughout the occupational structure.

Table 3.6 below, constructed from the Labour Force Survey data lends support to this analysis in suggesting that an increasing number of new entrants into the labour force during the early period (1970-1974) found employment in white-collar occupations. The proportions newly

Table 3.6: Percentage Distribution of New Entrants into Urban Employment by Occupational Category

Occupational category	Year					
	1970	1971-2	1973-4	1975-6	1977-8	1980
Casual & unskilled labour	29	26	22	23	30	46
Lower blue-collar labour	14	11	8	16	13	9
Upper blue-collar labour-machine operators, m-c tool makers, & foremen	29	22	26	22	22	14
Lower white-collar labour	18	29	30	33	24	24
Upper white-collar labour	10	12	14	6	11	7
TOTAL	100%	100%	100%	100%	100%	100%
All blue-collar	72	59	56	61	65	69
All white-collar	28	41	44	39	35	31

Source: Labour Force Survey, 1980

employed in the white-collar category increased from 28% in 1970 to 44% in 1974. Correspondingly, the proportions employed in blue-collar categories decreased from 72% in 1970 to 56% in 1974.

Between 1975 and 1980, however, various factors significantly changed both the volume and nature of industrial demand for labour. In 1975, for example, the additive effects of the 1973/4 increases in the price of oil, and the associated international recession dramatically reduced total exports from Kenya and simultaneously constrained expansion of the monetary urban sector. Private industrial demand for imported primary and processed raw materials decreased by 7.9% in 1975; total wage employment declined by 2% for the first time in two decades of expansion.

And then, between 1976 and 1977, a 400% and 150% increase in the respective prices of coffee and tea, which together form the bulk of Kenya's exports, earned the country a short-lived, expensive remission from its decline. Overnight, the sharp rise in spending power allowed the economy to re-expand and inflate. The sudden and powerful injection of foreign exchange into the economy was translated into an immediate demand for consumer goods. In the wake of this demand, the industrial sector recovered from its 1974-1975 recession and accelerated growth to achieve a peak growth rate of 18.5% per annum in 1975-6 compared with -0.2% in 1974-5. Slack capacity was utilized to the full and further industrial demands for increased capacity were evidenced by a substantial rise in real capital investment.

During 1976 and 1977, respectively 21% and 22% of domestic resources (GDP) were channelled into investment, the bulk of such investment taking the form of purchases of capital equipment. In 1976, purchases of machinery rose by 23% while that in transport equipment rose by 58%. Exacerbating the expansionary effect of existing investment subsidies, the ill-advised (1977) removal of import payment restrictions in capital equipment in the wake of peak import demand, marked the beginning of the second crucial phase in the country's development.⁸

Table 3.7: Percentage changes in Growth, Capital Formation and Employment 1975-1980

	Year					
	1975	1976	1977	1978	1979	1980
Change in GDP at Factor Cost	5.1	7.3	5.2	3.1	2.4	0.1
Change in Capital Formation	-2.3	1.4	20.9	16.1	-6.4	-10.8
Change in Employment	-1.0	4.6	5.2	1.0	6.7*	3.4*

Source: Statistical Abstract, Kenya 1981

* includes 8.9% and 11% increases in public sector employment required under a 10% compulsory increase demanded by Presidential Decree in 1979-1980. Private industrial demand for labour actually fell during these years.

In terms of its effect upon employment, it is clearly unfortunate that the rise in the price of Kenya's export commodities, although spectacular, was short-lived, and that monetary policy compounded the effect by reducing the cost of capital formation. For it is certain that the two events - a decrease in the effective price of capital (implicit in the removal of import payment restrictions) and an increase in the demand for capital - combined to make the

8. During the early period, 1973-1976, when there was a substantial deterioration in Kenya's balance of payments position, a number of restrictions had been imposed by the Central Bank of Kenya on imports. These included a 100% deposit (in foreign exchange for some commodities) and restrictions on overdraft facilities for certain imports. These restrictions were lifted in 1977 - Central Bank Circular 3/77/4 and 7/77/10.

marginal cost of capital-intensive techniques lower than before. And, as the ground swell of demand for capital investment gathered momentum, industry began to switch from relatively more labour-intensive techniques: new investment took the form of modern-vintage, highly-efficient capital technology embodying the factor-price ratios of developed countries.

By early 1979, (export commodity prices having fallen steadily for a year) the Central Bank of Kenya reimposed a variety of restrictions upon capital-goods imports, as a means of reducing future demand for imports and of meeting the requirements for an IMF loan now needed to adjust Kenya's balance of payments deficit. The harm had, however, already been done.

The sudden and powerful increase in capital formation had two lasting effects upon employment. In the urban sector, the first of these changes involved an immediate and absolute reduction in the quantity of labour demanded by industry, even during that period when the economy was expanding, as capital-labour ratios increased.

The second and perhaps more devastating repercussion of the high degree of capital formation involved a structural alteration in the demand for different categories of labour. In moving from production via older vintage capital to long-term production on newer vintage capital, industry shifted the nature of its demand for labour - a shift whose impact tended to increase the number of new jobs in blue-collar occupations (which traditionally require less educational skills) and decrease the number of new jobs in white-collar occupations (which

traditionally require greater educational skills) and these changes were crucial to the rates of return obtained for education in 1980.

Production in the late 1970's (on new capital equipment) began to require either casual or unskilled blue-collar labour (which, under supervision, could be trained to specialised tasks), or skilled blue-collar workers - particularly machine operators, machine fitters and precision instrument makers. Entry into these occupations as a proportion of total new employment rose to 26%, 13% and 8% respectively for unskilled labour, machine operators and mechanics. Indeed, these three categories accounted for 47% of total new employment during 1977-1978, the period of rapid capital formation. Even in 1979, the first of the years of economic decline, entry into these occupations was still rising as a proportion of new employment; in 1979 it stood at 54% of new employment for these categories of labour. These proportions may be compared with those for the earlier period: 38% in 1975-6; 42% in 1974 and 30% in 1971-2.

Part of the labour demand in skilled and unskilled blue-collar occupations was met by some of the educated unemployed hitherto seeking work in clerical or administrative occupations, without success. But because wages in blue-collar occupations, although rising as a result of the greater demand for such labour, were still absolutely lower than those obtained at white-collar levels, the rates of return to secondary and high-school education fell during this period. Indeed, it is this misalignment of supply and demand for educated skills - exacerbated by the high rate of capital formation - which allowed the rates of return to lower levels of education to fall to the levels observed for 1980.

(3) Supply and Demand Interactions

In a surplus labour market, where labour numbers and skills are in excess of those required, the demand for particular categories of labour is satiable; as labour enters the market in numbers far exceeding job vacancies for their skills, then some of the possessors of those particular skills will find that the demand for labour in the occupations to which they are best fitted has been satisfied by the labour of men even better fitted than themselves; the excess labour will be compelled to go downwards in the labour market to offer their services. Rationally, they will try to come as close as they can to maximising their reward (obtaining the highest price they can for their skills) if they offer their labour to occupations next highest, but lower in skill requirement to their competence. In achieving such a solution, however (a) some of their skills will remain unused because the occupation to which they are allocated uses only a proportion of their entire range of skills; (b) the disequilibrium will echo downwards in the occupational structure until the excess of supply over demand becomes most visible at the lowest entry points into the occupational structure; (c) excess supply of labour will bid down its hiring price - and implicitly its rate of return - relative to its skills; and (d) as labour is driven further and further downward in its attempt to obtain employment, the employer will begin to artificially upgrade the educational quality of those jobs in which the demand for labour is contracting (and vice versa). (Raising educational entry levels for an occupation automatically inhibits applications from those cohorts of labour lacking the required qualifications).

For the entrepreneur there will be a gain resulting from the relative lowering of labour costs (as excess labour bids down its wage price) and from a relative rise in the educational skills of labour. For the worker and the economy as a whole, the educational resources embodied in labour, unused by the occupation will be lost to the economy. This would have the following consequences. The main effect would be a lower social and private rate of return to a given level of education as the educational quality of the relevant occupations is upgraded - with obvious implications for educational investment. In the long run, as long as the public sector continues to subsidise education, over-qualified labour will continue to enter the labour market forcing employers to further upgrade the educational qualifications of jobs.

The interaction between supply and demand of labour in Kenya can best be seen in an analysis of wage trends and changes in the educational quality of jobs and labour before and after 1959.

Table 3.8: Changes in Average earnings in selected occupations 1972-1979. (1972=100)

Occupation	Year				
	1972	1973	1974	1976	1977
Unskilled	100	108	80	109	80
Semi-skilled	100	81	114	142	150
Skilled	100	69	153	193	183
Shop-assistants	100	92	96	93	81
Clerical	100	89	90	82	88
Secretarial	100	203	39	91	79
Mid-Management	100	94	86	90	81
Technicians	100	89	96	64	82

Source: Kenya, Department of Employment: Employment & Earnings annual publications, 1972-1977

Note: Figures are not available for 1975.

Table 3.8 above, which provides the average wages for selected occupations between 1972 and 1977, evidences the excellent bargaining position of

Table 3.9: Supply and Demand for Educational Skills*
by occupational category and date of entry
into the labour force.

Occupational Category	Education					
	Demand*	Supply+	Demand	Supply	Demand	Supply
	Before 1959		1960-1969		1970-1980	
1. Casual	--	--	--	--	0.0	18.4
2. Unskilled	0.3	7.1	0.8	9.8	1.4	18.4
3. Mason, carp.	0.9	10.9	3.0	10.0	1.0	23.3
4. Machine op.	2.3	7.7	2.2	18.6	1.9	18.1
5. Plumber	0.0	15.0	8.0	19.0	2.8	20.4
6. Driver	4.7	7.3	6.0	15.0	3.5	20.7
7. Self-employed	-	--	5.0	20.0	--	--
8. Mechanic	7.7	11.5	8.9	23.8	5.9	21.3
9. Foreman.	8.9	18.7	12.1	25.6	18.3	32.1
10. Electrician	10.0	10.0	5.0	15.0	20.0	30.0
11. Other skill.	10.0	8.6	15.0	24.2	18.0	32.0
12. Sales staff	12.0	26.0	16.7	32.8	22.1	30.4
13. Clerk	18.8	25.5	22.7	32.2	26.7	33.2
14. Typist, secr.	16.7	23.3	26.1	33.1	30.7	31.3
15. Mid-mgmt.	34.3	37.1	33.6	42.7	42.0	55.7
16. Agronomy	--	--	55.0	55.0	47.5	60.0
17. Architect	--	--	75.0	75.0	37.5	52.5
18. High-mgmt.	53.3	31.7	53.3	65.8	50.0	63.3
19. Accountant	55.0	55.0	61.7	43.3	68.3	58.3
Mean Values	6.6	12.8	12.8	23.3	13.3	26.1

Source: Labour Force Survey, 1980

Notes: * The point scores for the table were obtained in the following way. Each employer in the Labour Force Survey was asked to define the minimum level of education required for each job. Weights were then assigned to each educational skill as follows:

No education required 0 points
Up to 7 years schooling
required 10 points
11 years schooling
required 30 points
13 years schooling
required 55 points
University or equivalent
required 75 points.

+ Each person working in a particular job was interviewed as to his educational credentials. Weights similar to those detailed above were attached to his qualifications for direct comparison with the demand for educational skills by employers.

employers hiring white-collar labour during this period. For white-collar occupations - shop-assistants, clerks, secretaries, mid-management, technicians - there was a continuous fall in real wages during the period. But in unskilled and skilled blue-collar occupations, trends in wages rose in real terms after falling briefly in 1973.

Trends in educational entry levels of occupations match these patterns. For blue-collar occupations, Table 3.9 indicates that industrial expansion and the rigidities incurred by investment in capital equipment necessitated employment of unskilled manual workers and skilled blue-collar workers - mechanics, machine tool makers, fitters, machine operators - which categories of labour were in short supply. And in keeping with this rising demand relative to supply, the later period 1970-1980 was marked by a substantial downgrading of the educational qualities of these jobs. It is of some significance that the categories of labour in shortest supply (occupational categories 4 and 8 in Table 3.9) obtained an unprecedented lowering of job entry qualifications to *below* 1959 levels.

Arguably, the fall in educational entry qualifications and rising demand at blue-collar levels, co-existent with declining demand (and unfulfilled expectations) of labour at higher occupational levels would drive labour downwards to breach the gap between supply and demand at the blue-collar level - unless, of course, the wage differential between blue and white collar occupations were still so wide as to make it privately profitable to remain only laterally or upwardly mobile - or to stay out of the labour market altogether. Presumably in an attempt to reduce the wage differentials between these two types of occupation and thus increase the private profitability and probability of downward

mobility- and implicitly the rates of return to secondary and higher levels of education - employers increased the average wages in blue-collar occupations and lowered the educational qualifications attached to such jobs. Indeed, blue-collar occupations appear to have been unique in their ability to command real and consistent wage increases during a period of declining wages in the rest of the labour market.

E. Group Differences in Rates of Return to Education

We turn now to inequalities in ethnic propensities to invest in educational skills.

Despite all the official announcements of progress in educational expansion, the feeling that equality of educational opportunity is not yet an accomplished fact, and has led to marked income differentials between groups, has persisted.

Present cumulative investment in education by an individual from a particular tribe in Kenya is normally based upon expected future returns from such investment. And the rate of return which the individual expects to obtain is related to the rate of return which the most recent cohort entering the labour market actually receives. But because capital expenditure on primary education is privately financed (or disproportionately so, compared with other levels of education) there are ethnic and geographical differences in costs of education, and therefore in rates of return and propensities to invest.

Differences in costs are not, of course, the only reasons for ethnic differences in rates of return. Some ethnic groups are handicapped by having poorer parents and inferior career experiences than others - at

the same educational level. For in Kenya, as in most other countries, there are considerable differences in financial returns between occupations, and strong associations between ethnic groups and occupations.

As long as one tribe has a lower probability of entering white-collar occupations than others (educational skills being the same) then the benefits to the extra education, measured in terms of earnings, will be lower for that tribe. The cumulation of these distinct, though not unrelated disadvantages between ethnic groups - higher educational costs, inefficient capital markets and lower occupational benefits - creates profound inequalities in ethnic rates of return to education.

Separating our sample of employees by ethnic group and by education attained, we computed the private internal rates of return for each educational level by race. The costs consisted of earnings foregone while attending school after the age of 18, tuition and other direct school-related expenses. Data on school-related expenses was obtained from the Schooling Survey, 1980. Foregone earnings were estimated from the data on urban earnings. The computed rates of return are given in Table 3.10 below.

Table 3.10: Rates of return to Education, by Educational level and by Tribe

Tribe	Educational Level			
	Primary	Secondary	Higher	University
Kikuyu	11.5	27.0	14.9	37.0
Asian	-	24.0	14.5	30.0
Luo	5.0	17.0	34.0	-
Kamba	10.5	9.0	-	-
Mijikenda	11.5	8.6	-	-
Luhya	4.0	5.5	16.0	-
(N)	(648)	(667)	(101)	(30)

Source: Labour Force Survey, 1980

A number of comments may be made regarding these figures. Firstly, it is suspected that the opportunity costs of schooling are higher and begin at earlier ages for children in poorer communities and for children from semi-arid areas; part of the reason why enrollment rates in these communities is low, arises from the fact that as soon as the muscles of the children in these areas becomes large enough to help with household chores, they are withdrawn from schools. If this suspicion were correct, it would mean that we have understated the costs for some tribes - Mijikenda, Luhya - and the rates of return to education for these groups will be biased upwards.

Secondly, the figures in Table 3.10 reflect the general trend of rising returns to increased education. Most significantly, however, there are clear and important differences between groups in their rates of return to incremental education.

For the Kikuyu, the rates of return are highest at the completion of University education, and, to a lesser extent at the completion of secondary school. In the former instance, since the cohort (in our sample) with University education consisted predominantly of Kikuyu individuals, it is extremely unlikely that other tribes with equivalent educational skills would obtain such high returns. We shall show, in Chapter 7, that the Kikuyu ethnic group is subject to particularly high intergenerational mobility; the majority of respondents with University education were the sons of other white-collar workers, and this association has enabled the Kikuyu group to consolidate a position in the labour market in an unparalleled manner. Indeed, the Kikuyu have a comparative advantage in finding white-collar jobs.

With regard to their rates of return to secondary education, there is probably an upward bias in the observed rates, because most of the sampled cohort of Kikuyu (with secondary education) entered the labour market during the middle and late sixties, at which time the average rates of return to secondary school education were particularly high (around 32%). A similar bias would apply to the rates of return for the Asian group.

For all other ethnic groups - with the exception of the cohort of Luos who obtained high school education - the rates of return are lower than those obtained by the Kikuyu and reveal their relative disadvantages in the labour market. We have, of course, not controlled for occupation in computing these rates of return; as mentioned earlier, some ethnic groups are handicapped by having inferior career experiences than others at the same educational level, and this proclivity of some tribes to accept jobs of lower occupational (and wage) standing would in part account for their lower returns to education.⁹

One implication of these findings is that only the Kikuyu, Asian group and Luo have an incentive to increase their total investments in education and to make the sacrifices that such investment entails. For other groups, the returns to non-human capital investments might well yield higher returns. Being robbed of the financial incentive to incur educational costs may help explain why these groups exhibit little interest or motivation in pursuing their education, thus further increasing income inequalities between ethnic groups.

9. We compare occupational attainments by ethnic group in Chapter 7. For the present it is only necessary to mention that these differences exist.

Finally, it must be mentioned that the same number of years of schooling may not provide the same degree of training and knowledge for all groups because educational facilities and instruction may be inferior for some groups. But whether discrimination occurs in the educational system or subsequently in the labour market - or to some extent in both - is at present unknown, although clearly an investigation of each aspect has important implications for future inequalities and propensities to invest in education.

F. Conclusion

The general conclusion to which the findings in this chapter point, is that the Kenyan earnings structure is largely governed by the universalistic criteria of achievement in education, with the notable exception of the influence of race. Earnings rise with age, although the rate at which they rise depends upon education achieved. The higher the educational level, the steeper the age-income profile.

Secondly, the income effects of education - except in the special case of University graduates - have fallen over time. Thus, 1968 entrants to the labour force had considerably higher rates of return to education than labour entering the market in the seventies. The only educational category to which this experience has not applied, are University graduates, who in 1980 obtained higher rates to their investment than during the previous decade.

The fall in the rates of return to education between 1968 and 1980 can largely be explained by an aggregate fall in demand for white-collar

labour and a lowering of wage rewards in these occupations.

Thirdly, despite the problems inherent in deriving and interpreting rates of return computed from cross-section data, there is evidence to show that rates of return tend to rise with incremental schooling - largely, we believe, due to the high private costs of primary schooling, and low wage rewards to such schooling in the formal sector. These rising rates of return to incremental schooling can have important implications for family investment in education between siblings.

The analysis also suggests that there are marked inequalities between ethnic groups in their returns to education, and those groups with the lowest returns - the Mijikenda, Kamba and Luhya - are likely to make smaller future investments in the education of their offspring. The differences in returns are partly a result of differences in the private costs of schooling between tribes, but they are also a result of different occupational achievements by race, when the level of schooling is held constant.

What is not clear from the analysis is whether the differences in returns resulted from the fact that some races were more willing (in a surplus labour market) to lower their job aspirations and consequently their returns to education, or whether there were qualitative differences in educational achievement between groups. Since in rural areas, schools are geographically segregated by tribe, the same number of years of education may not yield a constant increase in skills for all groups; indeed occupational and income differences by tribe may reflect qualitative differences

in educational skills.

In sum, the analysis in this chapter reveals differences in rates of return by educational level and by race. In the latter instance, the evidence has suggested that individuals from different communities or kinship groups have either behaved in a systematic way in the labour market or have been subject to similar difficulties or opportunities prior to their entry. In either case, an understanding of the factors underlying the formation, growth and perpetuation of such kinship inequalities is required.

CHAPTER FOUR
REGRESSION ANALYSES

A. Purpose

The previous chapter has suggested that there is a strong positive relationship between investment in education and earnings, although unequal costs and benefits between groups have had their effect in different rates of return.

In this Chapter, we measure the direct and indirect effects of schooling (and other variables) on earnings, and we also use the information obtained on rates of return to education to ask what effects rising rates of return to incremental schooling have had upon the way in which parents allocate their investment resources between children.

The question we wish to ask is: to what extent does education operate as an independent influence on earnings, and to what extent is it modified and conditioned by kinship and family associations? To answer this question, we posit a model which incorporates two relationships: a statistical dependence of schooling on family background, and a subsequent dependence of earnings on schooling and family background. Thus schooling is hypothesised to be an intermediary variable which may operate to transmit the influence of family structure and socioeconomic status on earnings, in addition to its independent contribution to income. Within the confines of this recursive model, there is the possibility of direct effects of family background on occupational achievement and earnings, and indirect effects via schooling.

B. Introduction

Underlying the public expansion of educational facilities during the sixties and seventies in Kenya, was the belief that investment in education would raise the level of human capital endowments from which current and future outputs and income would be generated. Allied to this public view of education was the assumption that acquisition of an occupation, which leads to remuneration in the form of earnings, would be typically an achieved and achievable status based considerably and primarily upon a worker's own scholastic abilities and work performance, rather than on any 'ascribed' status or membership in a recognised social group. Hence the nationwide expansion of educational facilities was seen both as a means of raising productive potential across ethnic and regional boundaries and also as a tool for eroding existing inequalities in income and status.

Recent observation of the Kenyan social structure, has, however suggested that not only may there well have been variations between and within groups and families over time in the degree of opportunities for educational investment, but it is likely that there have been significant differences in the extent to which individuals have been recruited or assigned to jobs on the basis of their productive competence. Alternatively, it has been suggested that differences in earnings have resulted from the fact that some races - in a surplus labour market - were more willing to lower their job aspirations (and wage returns) than other tribes. These variations would allow the rates of return on investment in education to be unequal or at least be modified by the effects of home environment and ethnic origin. Certainly, the observed close associations between education

and circumstances of birth, family, kinship group, social class and earnings has led to the belief that there is a considerable degree of occupational and earnings inheritance within the Kenyan labour market, which effects would, over time, overshadow or interact with the effects of self-investment in education and in turn work against the chances of those workers emerging from kinship groups or families of lower economic origins. In this respect, the fortunes of children would be linked to that of their parents not only through family and ethnic differences in propensities to invest in human capital but also through market inheritances acquired from parents and/or kinship groups.

In principle, these observed associations would not, of course, deny the human capital theory of investment. To be in any occupation, an individual is required to perform that role - to at least a minimum degree - however much a father's achievement or association with a particular ethnic group may facilitate acquisition of that role. But differences between families or ethnic groups in rates of return to education (or other parameters) would raise inequalities in income and stretch out its distribution because these differences would interact with income and market luck.

It may be that ethnic differences in rates of return to education merely disguise the fact that there are imperfections in the capital market which constrain educational investment for some groups and not others. Over time, the higher propensity of one ethnic group to invest in education would raise total income inequalities by skewing their income distribution to the right even if ability, access to schools and other qualities were symmetrically distributed across the population.

In measuring the effects of investment in education on income, complications arise for any one group because the existence of such associations, of whatever degree, is not self-explanatory. One or more mechanisms may combine to produce the desired or observed result. For example, the range of inherited skills which human beings possess in childhood may also be modified by the character of schooling inputs, in addition to the quantity of schooling. Therefore, even if innate abilities or inherited background of individuals were to be homogeneous, the effectiveness of schools being far from uniform across schools and across provinces, significant variations in achievement may arise merely because of systematic differences in school quality. Of course, once the homogeneity assumption is removed, schooling inputs would be expected to link differentially with background factors so as to modify ability, personality and motivation to achieve, both in school and in occupation.

The relevance of this problem in an analysis of the effect of educational and other investments on income in Kenya is readily apparent. At the primary level, schools are financed by voluntary contributions from parents. As long as access to and quality of schooling is determined primarily by exogenous influences and is randomly distributed across ethnic populations, then it is perhaps arguable that quality of schooling is valid as an independent variable in an earnings function. But it would seem obvious that the structure and power of ethnic groups would play a role in shaping institutional factors governing both access and quality of schooling. And if one acknowledges in principle that the family decision-making unit can be coupled with and alter institutional structures (such as the quality of the school) then the family and ethnic group would be correlated with school quality, and each of these variables would have unstable and

biased coefficients in an earnings function.

As a result, individuals from a more economically advantaged background would have two distinct advantages over individuals from a less advantaged background. First, the combination of material advantage and strong educational interests provided by the advantaged environment would stimulate a high motivation to achieve in education and in career; second, their relatively advantaged environment, relatively high income and interests in education, higher schooling quality and contacts in the career world would provide a strong financial and informational support system which would enhance their probability of success in education and in careers. If economic advantage were associated with ethnic grouping, then inequalities in education and in income would also become associated with ethnic grouping.

C. The Model

(1) The Basic Framework

The basic analytical framework for measurement of the extent to which knowledge of the factors bearing upon a particular individual enable one to predict their earnings, is the human capital earnings function which was developed by G.S.Becker and J.Mincer. The model (which has come to be used extensively in the human capital literature) simultaneously provides one, by way of the partial coefficient attaching to each factor, with estimates of the extent to which a given change in a factor will affect the earnings of the individual concerned when other factors are held constant.

In the model, earnings endowment is expressed as the sum of returns to all previous investments in human capital, as well as inherited parameters. In the equation we use, the dependent variable income (Y) is monthly wages before tax, X_i ($i = 1 \dots n$) are n independent variables - continuous, categorical or dummy, a_i , b_i ($i = 1 \dots n$) are coefficients to be estimated and u is the stochastic disturbance term with zero mean and constant unknown variance.

$$Y = a_i + b_i X_i + b_2 X_2 \dots b_n X_n + u$$

The model implies an additive causal relationship between the independent variables and income.

Conceptually, the earnings function unifies analyses of investment behaviour with those of income opportunities and income distribution. In human capital terminology it provides an analytical framework for measuring and separating the fraction of earnings inequality attributable to variations in the volume of self-investment activities - particularly schooling and on-the-job-training - from those attributable to ascriptive forces not within the control of the individual.

In this respect, the regression procedure allows the separation of the rates of return to education (even at different education levels) from the rates of return to associations with different ethnic groups and alternative investment activities. The coefficient of determination between, for example, schooling and earnings, will represent an estimate of the fraction of earnings inequality solely attributable to differences in years of schooling, and so on for each of the other factors introduced into the equation.

(2) Model Limitations

But as a description of the process of acquiring or increasing labour productivity via investments in various activities undertaken during the individual's lifetime, the formulation leaves something to be desired: it presupposes the capability of measuring the variables taken to represent the relevant conditions, and assumes that the variables used to measure such conditions are independent of each other.

Consider the independent variable, education. The hypothesis underlying its use within the equation is that the quantity of schooling attained, and therefore mere presence within the educational system, is a measure of the learning process assumed to affect the marginal product of the individual. In practice, however, it is plausible that schooling is not a product-enhancing activity but a variable which masks the effect of ability. It may be that the quantity of schooling attained represents the tendency of persons with greater ability to acquire more formal education, in which case the coefficient to schooling would then be best interpreted as a return to the screening mechanism for such ability.

The second deficiency is inherent in the use of the regression technique to test the hypothesis that differential investments in schooling independently affect earnings. As long as the variables included in the equation are orthogonal, then the increment in explained variance associated with the addition of another variable into the explanatory equation will express the unique effect of that variable on wages. And its coefficient will be a stable and unbiased estimate of its effectiveness as an investment option.

However, when the explanatory variables are correlated with each other, as are (to a certain extent) background characteristics of workers, the addition to the proportion of variance in earnings that each factor will explain, will be dependent on the order in which each is entered into the equation: the shared proportion of variance will be attributed to that variable entered first, and the coefficients of inter-correlated variables will tend to be unstable. In addition, the linear additive form of the equation implies that the various independent variables are perfect substitutes in determining earnings. This may be true for some of the variables entered, but it is unlikely to be so for education and ability and the additive inclusion of both into the equation suggests that the rates of return to schooling would be uniform for all individuals independent of ability.

Despite the shortcomings of the regression model for our purposes, it has the merit of expressing the relative efficiency of different factors and can adequately be used as a determinative equation rather than as an explanatory one. And its main purpose in this chapter is to focus our attention on three factors affecting variance in earnings: education, kinship origin and family structure.

(3) The Variables

In the regression analysis, variations in earnings were determined by associations with variables obtained from the Labour Force Survey, 1980, fully described in the previous Chapter. The variables can be categorised as follows:

- (a) investment in education - quantity and quality;
- (b) Job experience;

- (c)ability;
- (d)ethnic origin;
- (e)family size and birth order of individual;
- (f)socioeconomic origins.

Each of these factors are described in turn.

Educational investment was expeditiously measured by the amount of formal education completed by each respondent - represented as years of schooling. A crude approximation of quality of schooling was obtained by incorporating 'type of schooling' variables into the model rather than by trying to approximate the average expenditure per pupil in each school. Respondents were asked to name the schools they had attended and these schools were subsequently separated (in line with Ministry of Education classifications) into two categories for primary school (public and private) and five categories for secondary school (public, private, harambee, technical and mission).

Places in private schools (normally high-cost, high-quality schools) are always in short supply and high demand, but can be obtained by the payment of relatively high fees (suggesting an advantaged socioeconomic background) and to a lesser extent, by winning a tuition scholarship. Government and mission schools are subsidised respectively from public funds and private charitable donations; harambee schools are run on a self-help basis and have become synonymous with low-cost, low-quality inputs. Within each category there has always been a wide range of variation in quality and efficiency of inputs and it must therefore be mentioned that the 'type of schooling' variable used in the equation was a very imperfect measure of schooling quality.

Job experience was measured by the length of formal employment. Every year following termination of schooling was accounted for in terms of employment status: unemployed and actively seeking work, unemployed and not seeking work, or employed full-time. If employed, details were obtained of the nature and duration of employment.

In the hypothesised chain of determination, ability was the one variable we could not measure directly. Broadly interpreted as 'learning power' (the ability to retain ideas and comprehend and solve abstract problems) there are two views on ability: if more able persons learn the same skills as others but more rapidly, the earnings profile of the more able will rise more rapidly until that point at which full job competence is also reached by the less able. If, alternatively, differential ability inhibits or enhances the acquisition of skills, then the earnings differential of the more able will persist over time as they acquire and accumulate more complex skills and are correspondingly rewarded for such skills. Presumably these earnings differentials would then become more important (and visible) at higher levels of education.

Whatever the view, we had no direct measure of learning ability for our respondents. Standard tests of measured ability - IQ or other tests of cognitive or non-cognitive ability - are not undertaken for people in Kenya, and, even if they were, the complexities inherent in the construction and delivery of such tests of competence among different tribal groups would make interpretation of their values a difficult exercise. There was, in effect, no empirical counterpart to the theoretical definition of ability which we could use.

However, as an approximate measure of such ability, or efficiency in learning, relative examination performance in the standardised examinations taken in all schools at the conclusion of primary (7th year) secondary (11th year) and high school (13th year) were used. In the case of primary school, only two levels of aptitude were available: pass or fail. At the secondary level, there were five divisions of aptitude: pass - Division I, Division II, Division III, General Certificate of Education; and fail. At the termination of high school, there were four divisions of aptitude: pass in 3 principal subjects, in 2 subjects, in one subject and Fail. The use of dummy regressors allowed a total of eleven variables measuring aptitude.

It must be mentioned however, that the use of academic examination performance as a measure of innate ability is liable to a number of valid criticisms: Firstly, the measure excludes all persons not reaching the point at which they would normally take the relevant examinations. In our sample there was no measure of ability for 368 persons with less than 7 years of schooling. Secondly, the measure chosen expresses the ability to perform well in examinations of an academic nature, and such ability may or may not be correlated with the 'learning power' one would wish to represent. And, of course, scholastic achievement may be highly associated with school effectiveness. The last and perhaps the most crucial deficiency in the use of performance on standardised achievement tests lies in their inadequacy as a measure of the D-factor: drive, dynamism, determination and discipline - which factors are probably relevant to performance on the job.

Turning now to the demographic variables, sex and tribe were measured dichotomously, with the aid of dummy regressors. Information was additionally obtained on number of respondent siblings, family size, birth-order, marital status and number of dependants. Age, measured in a number of different ways, was used to capture the effects of time specific opportunities and constraints, and was also used as a measure of the depreciation factor in human capital. Because individuals are not continuously employed in the formal labour force after the completion of schooling and because there were individual variations in the age at which schooling was completed there was very little correlation between age and experience in our sample of respondents. The inclusion of regressors for both age and experience in any equation did not therefore render the regression subject to multicollinearity.

Lastly, the effects of socioeconomic origins - income, occupational origins, educational-intellectual stimuli at home - were measured in terms of seven variables describing the economic background of the respondent's family. Information was obtained on the occupation, education and literacy status of the mother and father of each respondent. Additional information was obtained on the size of the family land-holding, if any. Occupational origin and land-ownership were used as measures of relative socioeconomic status.

For the series of variables measuring employment and career contingencies, data was obtained on the length of migration to the place of employment, duration of unemployment in that city (if any); occupation (as a categorical variable and a series of dummy variables)

trade union membership (as a dummy variable) and finally by the size, ownership and industrial classification of the employing firm.

Finally, the dependent variable, earnings, was defined as total monthly income received in the job, before tax, excluding fringe benefits. All employees were full-time workers holding only one job. Additional income might have been acquired in the form of home cash-crop production. But the difficulties of imputing a monetary value to cash-crop income, given the seasonality and local fluctuations in product prices, and our concern with income as a measure of labour product in a particular job, led to an omission of this form of income for all respondents. In any case, the human capital model says nothing about farm income - when farm ownership is dictated by hereditary factors, as it is among most ethnic groups in Kenya.¹

A full list of the independent variables - 125 in total - their description, and the symbols sometimes used to identify them, is given in Table 4.1 below.

1. Genetically determined endowments, which include physical capital, race, ability, family reputation and 'connections' and the knowledge, skills and goals provided by a family to its sons, has been dealt with recently and extensively by G.S.Becker in A Treatise on the Family, Chicago: University Chicago Press, 1981. The section on intergenerational inheritances is based on his and Nigel Tomes' paper An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility, Journal of Political Economy, 1979, vol 87. no.6. This paper provides a unified framework for analysing inequalities in income deriving from differential investments in human capital and income inequalities deriving from differences in 'social capital' or genetic inheritances.

(4) Findings

A number of regressions were run in order to find the best statistical explanation for the variation in earnings between individuals. Alternative forms of the regression were often tried and variables modified and sometimes combined in order to improve the fit. Not all the regression results are presented here, but many of those which led to the selection of the 'best fit' have been included. In all cases, the stepwise procedure was used.²

The coefficients to the regression equations are presented in Tables 4.2 and 4.3 below. Basically, the equations describe an attempt to measure the approximate effect of two parameters on earnings - deliberate family investment in the education of a child, and inadvertent or intentional social skills provided to the child by the family of orientation. In the latter case, the endowments would include birth-order, sex, age and ethnic-origin, and the cultural goals and orientations associated with ethnic origin. Some ethnic groups or households for example, might prefer to promote the earnings success of male offspring rather than female offspring; cultural norms for family sizes might be different, and so on. Where this was the case, controls for tribe would, hopefully, measure the different ethnically-associated orientations and goals of the individual.

Perhaps before looking at the equations in detail, we should mention at the outset that the overall findings of the earnings functions were unambiguous: educational investment and individual operating rates within the school and at work consistently proved a

2. In stepwise regressions, independent variables are entered only if they meet certain statistical criteria. The order of inclusion is determined by the respective contribution of each variable to explained variance. In all the regressions run, we specified a minimum F value of 3.84 for inclusion of a variable into the regression equation.

much more important influence on earnings than ethnic origin or socioeconomic background. But the additional finding was that (a) there were differences between tribes in their propensities to invest in education; and (b) the family structure and birth-order of an individual significantly altered parental investment in his education, and therefore irretrievably modified his life-chances as an adult.

The latter finding was particularly significant for it showed not only that the framework of the family was useful and important in analysing differences in human capital investments between siblings, but that large families in Kenya universally improved the educational (and career) attainments of individuals. Rising rates of return forced parents to maximise future family income by concentrating their investment resources on the education of their first-born children, increasing the probability of their migration and employment in urban centres. Their later homeward remittances were used to compensate their younger siblings in terms of both human and non-human capital investments.

(i) Investment in Education and Experience

The attempt to measure the effect of differential investment activities upon the distribution of earnings was based initially on a simple human capital earnings function relating individual earnings only to schooling attainment and job experience. The equation was found to be powerful in its ability to predict observed differences in earnings: Over 52% of the inequality of earnings in the formal sector in 1980 could be attributed solely to differences in the volume of self-investment activities, and specifically to investments in schooling and job-experience.

Table 4.2 presents the results of the regression analysis using only schooling, ability and job experience as measures of self-investment activities. In all these regressions, the log-linear form of the regression proved superior and the coefficients to the independent variables therefore express (approximately) a relative percentage rise in income for an individual in the particular category when holding all other variables constant.

In the first equation (1), only one variable was examined: education. It appeared to explain 21% of variance in income and its coefficient suggested that each additional year of schooling raised earnings by 8%. Subsequent inclusion of job experience into the equation (2) increased the value of the coefficient to education (from .085 to .125) and simultaneously improved the predictive power of the equation to 42%.

In equation (3), dummy variables were added for discrete categories of schooling. (Completion of 4 years of schooling was relegated to the constant term). The differential impact of incremental education was now clearly visible in the consistent increase in the value of coefficients with additional education - a movement from a negative coefficient for those individuals with no schooling (-.0232) to a large positive coefficient at the higher levels of schooling (1.45 to 2.42). These coefficients, which can be interpreted as rates of return to the different levels of schooling, implied that lack of schooling had a negative impact upon earnings, whereas some schooling attainment had a positive impact - the magnitude of the effect being dependent upon the amount of education attained by the individual. Thus, completion of secondary school (11 years) increased income by 44.5% more than non-completion (8-10 years) and the sharpest increase accrued to those individuals who had either enrolled in or completed

Table 4.2: Regression coefficients of independent variables. Dependent variable, log income.

Equation No.	(1)	(2)	(3)	(4)
Dependent variable	Log income			
R ²	.207	.424	.504	.527
CONSTANT	6.27 (.040)	5.27 (.057)	5.72 (.05)	6.56 (.039)
Years of schooling(total)	.085(.005)	.125(.004)	.	-.123(.013)
Years of schooling ²	.	.	.	.012(.0009)
Dummy school categories				
No school	.	.	-.023(.062)+	
5-6 years	.	.	.156(.065)+	
7 years	.	.	.321(.058)+	
8-10 years	.	.	.508(.053)+	
11 years	.	.	.953(.057)+	
12-13 years	.	.	1.451(.070)+	
14+ years	.	.	2.419(.109)+	
Years employment (total)	.	.087(.005)	.085(.005)+	
Years employment ²	.	-.002(.0001)	-.002(.0001)	
Years school x yrs.empl. (EDEXP)	.	.	.	.005(.0002)
Ability variables:				
Primary - pass	.	.	.	+
fail	.	.	.	+
Secondary:Division I	.	.	.	.516(.104)
(O Level) Division II	.	.	.	.469(.067)
Division III	.	.	.	.127(.051)
Fail	.	.	.	-.308(.111)
High school: 3 passes	.	.	.	+
(A Level) 2 passes	.	.	.	+
1 pass	.	.	.	+
All coefficients given are significant at the 95% level.				
+ variable included in the regression equation, but dropped in the stepwise procedure. Not significant at the 95% level.				
. variable not included in regression run.				

Source:Labour Force Survey, 1980

some form of undergraduate training (over 14 years of schooling). It is remarkable that the income of this group was almost double that of a high-school graduate, although the actual differences in education between the two groups may have only been that of a single completed year of education.

At this point in the analysis (with only the experience and education terms entered) the predictive power of the equation was 50% and the coefficient to years of experience was not affected by the dummy variables for education.

The next equation (4) revealed a most interesting result: when proxies for ability (examination results) were entered into the regression equation, all the dummy variables for incremental education entirely lost their significance and were accordingly dropped in the stepwise regression procedure. One plausible reason for this occurrence was that the dummy variables for examination performance and the dummy variables for educational achievement were both measures of the same factor - the value added to individual product by the schooling process. In these circumstances, the inclusion of both series into any regression on earnings would inevitably render insignificant the less accurate of the two proxies.

One important point must be made here. That exam performance variables were a rather better proxy of value-added indicated that what employers valued about the education process was not merely the quantity of education achieved by an individual, but some indication of his operating rate or efficiency in the educational system. And employers expressed this utility in terms of a willingness to pay a premium for superior scholastic performance.

Whatever the underlying explanation, it was certainly interesting to note that the coefficients to ability matched the performance of the dummy variables for educational attainment - rising with better examination performance and falling with a deterioration in examination performance. For example, the achievement of a Division I grade in the EACE ('O' Level) examination benefitted the individual by a 51% increase in earnings capacity, whereas failing the same examination had a 31% negative impact upon earnings.

It must be stressed here that notwithstanding the removal of the dummy variables for education in the stepwise procedure of the regression, the coefficient to education, as always, remained significant, entering the stepwise procedure first and continuing to explain the same proportion of the total variance in earnings (28%). Similarly, the joint effect of job-experience and education, captured by the multiplicative term EDEXP, was also significant, explaining 15% of the variance in earnings. Thus the level of educational investment, the quality of school performance and experience on the job were shown to be three important investment activities affecting individual earnings.

(ii) Inherited Endowments: Ethnic Origin and Family Structure

Let us turn now to a series of equations (5-9) in which the respondent's age, sex, tribe, birth-order, family size, and socioeconomic origins were successively added to the regression on earnings. The coefficients obtained and the inclusion level of the variables entering the regression have been given in Table 4.3 . All coefficients are significant at the 95% level, but the standard errors (in the interests of legibility) have been separately given in Table 4.4 . Table 4.5 exhibits the percentage change in the coefficient of determination contributed to

TABLE 4.3: Regression coefficients of independent dummy variables on dependent variable: log salary

(Equation No.)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
R ²	.543	.549	.578	.578	.583	.639	.799	.803
CONSTANT	6.55	6.68	6.66	6.66	6.63	6.01	6.69	6.02
Education'								
no school	.011 1	.010 1	.010 1	.010 1	.009 1	.007 1	.002 1	.004 1
5-6 yrs school	-	-	-	-	-	-	-	-
7 yrs school	-	-	-	-	-	-	-	-
8-10 yrs school	-	-	-	-	-	-	-	-
11 yrs school	-	-	-	-	-	-	-	-
12-13 yrs school	-	-	-	-	-	-	.144 23	.127 23
over 14 yrs school	-	-	-	-	-	-	-	-
Total yrs. school	-.111 6	-.106 6	-.097 7	-.098 7	-.094 7	-	-	-.034 31
ABILITY:								
Primary exam fail	-	-	-	-	-	-.110 17	-.080 35	-.087 36
Sec.Exam.Div I	.547 4	.512 4	.358 10	.358 10	.343 1	.401 8	.20 20	.198 20
Sec.Exam.Div II	.475 3	.467 3	.404 8	.404 8	.402 8	.325 7	.19 19	.195 16
Sec.Exam.Div III	.157 9	.167 10	.144 12	.144 12	.141 12	-	-	-
Sec.Exam.Fail	-.309 7	-.298 7	-.299 9	-.299 9	-.314 9	-.412 9	-.240 28	-.227 28
3 'A' Levels	-	.273 11	.266 14	.266 14	.268 16	-	-	-
2 'A' Levels	-	-	-	-	-	-	-	-
1 'A' Level	-	-	-	-	-	-	.218 34	.236 35
JOBYRS :yrs empl.	-	-	-	-	-	+	.043 2	.032 2
EDEXP : (School x empl)	.005 5	.005 5	.004 6	.004 6	.004 6	+	+	.001 30
AGE:20-24 yrs	-.200 2	-.204 2	-.227 2	-.227 2	-.225 2	-	-.074 33	-
25-29 yrs	-	-	-	-	-	-	-	.054 37
30-34 yrs	.123 6	.123 9	.109 11	.109 11	.105 11	-	.063 27	.095 27
35-39 yrs	-	-	-	-	-	-	-	-
40-44 yrs	-	-	-	-	-	-	-	-
45-49 yrs	-	-	-	-	-	-	-	-
50 yrs +	-	-	-	-	-	-	-	-
SEX:Male	-	.153 8	-	-	-	.100 13	-	-
TRIBE:Kikuyu	-	-	-	-	-	-	-	-
Luo	-	-	-.096 13	-.096 13	-.113 14	-.076 18	-	-
Coastal	-	-	-	-	-	-	-	-
Asian	-	-	.430 3	.430 3	.428 3	.489 3	.215 6	.216 6
Kamba	-	-	-.182 8	-.182 8	-.198 8	-.138 15	-.059 30	-.058 34
Luhya	-	-	-.242 4	-.242 4	-.260 4	-.170 14	-.104 24	-.102 24
FATHER'S OCCUPATION								
None,casual,unempl.	-	-	-	-	-	-	-	-
Blue-collar	-	-	-	-	-	-	-	-
Self-employed	-	-	-	-	-	-	-	-
Clerical	-	-	-	-	-	-	-	-
High-management	-	-	-	-	-	-	-	-.124 33
Professional	-	-	-	-	.212 10	-	.114 32	.075 25
LANDSIZE:Hectares	-	-	-	-	.014 15	+	.073 25	-
DEMOGRAPHIC VARS:								
Number of siblings	-	-	-	-	-	-	-	-
Birth position	-	-	-	-	-	-	-	-
Dependants	-	-	-	-	-	-	-	-
SCHOOLING TYPE								
primary-public	-	-	-	-	-	-	-	-
private	-	-	-	-	-	-	-	-
secondary:public	-	-	-	-	-	.112 16	-	-
private	-	-	-	-	-	-	-	-
harambee	-	-	-	-	-	-.172 11	-	-.072 38
technical	-	-	-	-	-	-	-	-
mission	-	-	-	-	-	-	-	-.129 39
EMPL:yrs employment	-	-	-	-	-	.114 2	+	+
SQJOB: (Yrs empl)'	-	-	-	-	-	+	-.001 5	-.000 5
FIRM DESCRIPTION & SIZE								
Privately owned	-	-	-	-	-	-.308 4	-.166 7	-.161 7
Foreign owned	-	-	-	-	-	-.289 10	-.336 14	-.331 14
Manufacturing	-	-	-	-	-	.207 5	-	.127
Service	-	-	-	-	-	-	-.201 12	-.207 12
Firm size: 5-19	-	-	-	-	-	-	-	-
20-49	-	-	-	-	-	.200 6	.124 14	.269 15
50-99	-	-	-	-	-	-	-	-
100-199	-	-	-	-	-	-	.123 31	.127 32
200-499	-	-	-	-	-	-.104 12	-	-
RESPONDENT'S OCCUPATION								
01 Casual	-	-	-	-	-	-	-.600 17	-.628 17
02 Unskilled	-	-	-	-	-	-	.546 4	-.547 4
03 Mason,carpenter	-	-	-	-	-	-	-.470 13	-.456 13
04 Driver	-	-	-	-	-	-	-.330 19	-.320 19
05 Plumber	-	-	-	-	-	-	-.345 18	-.356 18
06 Electrician	-	-	-	-	-	-	-	-
07 Mechanic	-	-	-	-	-	-	-	-
08 Machine operator	-	-	-	-	-	-	-.477 9	-.474 9
09 Foreman,supervisor	-	-	-	-	-	-	-	-
10 Self-employed	-	-	-	-	-	-	-.573 28	-.570 29
11 Other skilled	-	-	-	-	-	-	-.358 21	-.350 21
12 Sales staff	-	-	-	-	-	-	-	-
13 General clerical	-	-	-	-	-	-	-	-
14 Secretarial	-	-	-	-	-	-	.259 11	.260 11
15 Mid-management	-	-	-	-	-	-	1.04 3	1.01 3
16 High-management	-	-	-	-	-	-	1.12 8	1.07 8
17 Teacher	-	-	-	-	-	-	-	-
18 Architect	-	-	-	-	-	-	.932 22	.855 22
19 Agronomist	-	-	-	-	-	-	.494 26	.479 26
20 Accountant	-	-	-	-	-	-	1.130 10	1.090 10

Source: Labour Force Survey, 1976

All coefficients significant at 95% level

Table 4.4: Standard errors of coefficients given in Table 4.3 above.

(1)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CONSTANT	.000	.000	.001	.001	.000	.000	.000	.000
Education acquired	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009
no school	-	-	-	-	-	-	-	-
5-6 yrs school	-	-	-	-	-	-	-	-
7 yrs school	-	-	-	-	-	-	-	-
8-10 yrs school	-	-	-	-	-	-	-	-
11 yrs school	-	-	-	-	-	-	-	-
12-13 yrs school	-	-	-	-	-	-	.043	.042
over 14 yrs school	-	-	-	-	-	-	-	-
Total yrs school	.012	.012	.012	.012	.013	-	-	.013
ABILITY	-	-	-	-	-	-	-	-
Primary exam fail	-	-	-	-	-	.050	.039	.023
Sec. Exam. Div I	.103	.103	.103	.103	.103	.093	.078	.070
Sec. Exam. Div II	.055	.055	.054	.054	.054	.055	.043	.044
Sec. Exam. Div III	.051	.051	.049	.049	.049	-	-	-
Sec Fall	.109	.109	.105	.105	.105	.097	.073	.072
3 'A' levels	-	.137	.133	.133	.132	-	-	-
2 'A' levels	-	-	-	-	-	-	-	-
1 'A' level	-	-	-	-	-	-	.101	.100
JCYRS:yrs.empl.	-	-	-	-	-	*	.004	.005
EDEXP. (School x empl.)	.0003	.0003	.0003	.0003	.0003	*	*	.0004
AGE:20-24 yrs	.0451	.045	.043	.043	.043	-	.031	.027
25-29 yrs	-	-	-	-	-	-	-	.027
30-34 yrs	.035	.035	.034	.034	.034	-	.025	.025
35-39 yrs	-	-	-	-	-	-	-	-
40-44 yrs	-	-	-	-	-	-	-	-
45-49 yrs	-	-	-	-	-	-	-	-
50 yrs and over	-	-	-	-	-	-	-	-
SEX:Male	-	.045	-	-	-	-	-	-
TRIBES:Kikuyu	-	-	-	-	-	-	-	-
Luo	-	-	.041	.041	.042	.038	-	-
Coastal	-	-	-	-	-	-	-	-
Asian	-	-	.078	.078	.078	.075	.058	.059
Kamba	-	-	.035	.035	.037	.034	.025	.025
Luhya	-	-	.036	.036	.036	.034	.025	.025
FATHER'S OCCUPATION	-	-	-	-	-	-	-	-
None, casual, unskilled	-	-	-	-	-	-	-	-
Blue-collar	-	-	-	-	-	-	-	-
Self-employed	-	-	-	-	-	-	-	-
Clerical	-	-	-	-	-	-	-	-
Mid, high-management	-	-	-	-	-	-	.042	.047
Professional	-	-	-	-	.056	-	.020	.020
LAND:HECTARES	-	-	-	-	.006	*	-	-
DESCRIPTIVE vars.	-	-	-	-	-	-	-	-
Number of siblings	-	-	-	-	-	-	-	-
Birth order	-	-	-	-	-	-	-	-
Dependants	-	-	-	-	-	-	-	-
SCHOOLING TYPE	-	-	-	-	-	-	-	-
primary-public	-	-	-	-	-	-	-	-
private	-	-	-	-	-	-	-	-
secondary-public	-	-	-	-	-	.045	-	-
private	-	-	-	-	-	-	-	-
hararee	-	-	-	-	-	.055	-	.034
technical	-	-	-	-	-	-	-	-
mission	-	-	-	-	-	-	-	.055
EMPL:yrs employment	-	-	-	-	-	.005	.004	.005
SQUCB: (Yrs.empl.) ²	-	-	-	-	-	*	.0009	.0001
FIRM DESCRIPTION & SIZE	-	-	-	-	-	-	-	-
Privately owned	-	-	-	-	.035	-	.023	.024
Foreign owned	-	-	-	-	.072	-	.049	.049
Manufacturing	-	-	-	-	.037	-	-	-
Service	-	-	-	-	-	-	.025	.025
Size: 5-19	-	-	-	-	-	-	-	-
20-49	-	-	-	-	.046	-	.033	.033
50-99	-	-	-	-	-	-	-	-
100-199	-	-	-	-	-	-	.047	.047
200-499	-	-	-	-	.038	-	-	-
RESPONDENT'S OCCUPATION	-	-	-	-	-	-	-	-
01 Casual	-	-	-	-	-	-	.079	.079
02 Unskilled	-	-	-	-	-	-	.029	.029
03 Mason, carpenter	-	-	-	-	-	-	.051	.051
04 Driver	-	-	-	-	-	-	.051	.050
05 Plumber	-	-	-	-	-	-	.053	.053
06 Electrician	-	-	-	-	-	-	-	-
07 Mechanic	-	-	-	-	-	-	-	-
08 Machine operator	-	-	-	-	-	-	.036	.036
09 Foreman, supervisor	-	-	-	-	-	-	-	-
10 Self-employed	-	-	-	-	-	-	.230	.229
11 Other skilled	-	-	-	-	-	-	.078	.078
12 Sales staff	-	-	-	-	-	-	-	-
13 General clerical	-	-	-	-	-	-	-	-
14 Secretarial	-	-	-	-	-	-	.046	.046
15 Mid-management	-	-	-	-	-	-	.055	.055
16 High-management	-	-	-	-	-	-	.099	.101
17 Teacher	-	-	-	-	-	-	-	-
18 Architect	-	-	-	-	-	-	.193	.194
19 Accountant	-	-	-	-	-	-	.150	.150
20 Accountant	-	-	-	-	-	-	.142	.142

All coefficients given are significant 100% level

- coefficients not included in regression equation

- coefficients not significant at 95% level and dropped in stepwise procedure.

Table 4.5: Percentage change in the coefficient of determination contributed by the addition of any independent variable. Independent variable log salary. 125

Equation	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Education squared	.284	.284	.284	.284	.285	.284	.284	.284
no school	-	-	-	-	-	-	-	-
55-6years school	-	-	-	-	-	-	-	-
7 years school	-	-	-	-	-	-	-	-
8-10 years school	-	-	-	-	-	-	-	-
11 years school	-	-	-	-	-	-	-	-
12-13 years school	-	-	-	-	-	-	.003	.003
over 14 years school	-	-	-	-	-	-	-	-
Total yrs school	.015	.015	.018	.018	.018	-	-	.018
ABILITY								
Primary exam fail	-	-	-	-	-	.001	.001	.001
Sec. Exam, Div I	.014	.014	.003	.003	.003	.010	.004	.004
Sec. Exam, Div II	.013	.013	.010	.010	.010	.011	.007	.007
Sec. Exam, Div III	.003	.003	.003	.003	.003	-	-	-
Sec. Fail	.005	.005	.005	.005	.005	.006	.001	.001
3 'A' Levels	-	.001	.001	.001	.001	-	-	-
2 'A' Levels	-	-	-	-	-	-	-	-
1 'A' Level	-	-	-	-	-	-	.001	.001
JOBYRS:yrs. empl	.156	.156	.156	.156	.156	+	.156	.156
EDEXP.(School x empl)	.018	.018	.010	.010	.012	+	+	.012
AGE:20-24 yrs	.029	.030	.029	.030	.030	.030	.001	-
25-29 yrs	-	-	-	-	-	-	-	.001
30-34 yrs	.029	.004	.003	.003	.003	-	.002	.002
35-39 yrs	-	-	-	-	-	-	-	-
40-44 yrs	-	-	-	-	-	-	-	-
44-49 yrs	-	-	-	-	-	-	-	-
50 yrs and over	-	-	-	-	-	-	-	-
SEX:Male	-	.004	-	-	-	.002	-	-
TRIBE:								
Luo	-	-	.002	.002	.002	.001	-	-
Coastal	-	-	-	-	-	-	-	-
Asian	-	-	.030	.030	.030	.030	.026	.026
Kamba	-	-	.008	.008	.008	.002	.001	.001
Luhya	-	-	.013	.013	.013	.003	.002	.002
FATHER'S OCCUPATION								
None	-	-	-	-	-	-	-	-
Blue-collar	-	-	-	-	-	-	-	-
Self-employed	-	-	-	-	-	-	-	-
Clerical	-	-	-	-	-	-	-	-
Mid- High-management	-	-	-	-	-	-	-	.001
Professional	-	-	-	-	.004	-	.001	.001
LANDSIZE	-	-	-	-	.002	+	.002	-
DEMOGRAPHIC vars								
Number of siblings	-	-	-	-	-	-	-	-
Birth position (order)	-	-	-	-	-	-	-	-
Dependants	-	-	-	-	-	-	-	-
SCHOOLING TYPE:								
primary-public	-	-	-	-	-	-	-	-
private	-	-	-	-	-	-	-	-
secondary-public	-	-	-	-	-	.002	-	-
private	-	-	-	-	-	-	-	-
harambee	-	-	-	-	-	.002	-	.002
technical	-	-	-	-	-	-	-	-
mission	-	-	-	-	-	-	-	.001
EMPL:yrs employment	-	-	-	-	-	.214	+	+
SQJOB: (Yrs empl) ²	-	-	-	-	-	+	.042	.042
FIRM DESCRIPTION & SIZE								
Privately owned	-	-	-	-	-	.033	.023	.023
Foreign owned	-	-	-	-	-	.003	.008	.008
Manufacturing	-	-	-	-	-	.018	-	.018
Service	-	-	-	-	-	-	.010	.010
Size: 5-19	-	-	-	-	-	-	-	-
20-49	-	-	-	-	-	.011	.009	.009
50-99	-	-	-	-	-	-	-	-
100-199	-	-	-	-	-	-	.001	.001
200-499	-	-	-	-	-	.002	-	-
RESPONDENT'S OCCUPATION								
01 casual	-	-	-	-	-	-	.005	.005
02 unskilled	-	-	-	-	-	-	.055	.055
03 mason, carpenter	-	-	-	-	-	-	.009	.009
04 driver	-	-	-	-	-	-	.005	.005
05 plumber	-	-	-	-	-	-	.005	.005
06 electrician	-	-	-	-	-	-	-	-
07 mechanic	-	-	-	-	-	-	-	-
08 machine operator	-	-	-	-	-	-	.015	.015
09 foreman, supervisor	-	-	-	-	-	-	-	-
10 self-employed	-	-	-	-	-	-	.001	.001
11 other skilled	-	-	-	-	-	-	.004	.004
12 sales staff	-	-	-	-	-	-	-	-
13 general clerical	-	-	-	-	-	-	-	-
14 secretarial	-	-	-	-	-	-	.010	.010
15 Mid-management	-	-	-	-	-	-	.057	.057
16 High-management	-	-	-	-	-	-	.015	.015
17 teacher	-	-	-	-	-	-	-	-
18 architect	-	-	-	-	-	-	.003	.003
19 agronomist	-	-	-	-	-	-	.002	.002
20 accountant	-	-	-	-	-	-	.012	.012

Source: Labour Force Survey, 1980

Note: + variable not included in regression equation.
 - variable included, but removed as insignificant at 95% in the stepwise procedure of the regression equation.

by the inclusion of any one variable in the series of equations.

(a) Ethnic Origin

Dummy variables for tribe were entered in equation (7) and they clearly exerted a systematic and consistent influence upon earnings. The coefficients for the Luo, Kamba and Luhya tribes (in contrast with the coefficients for the Asian group) indicated that membership of these groups had strong negative effects upon income. The coefficient for the Kikuyu tribe was included in the constant term. Altogether approximately 7% of explained variance in earnings could be shown to be a direct result of association with a particular ethnic group, and even further differences could be explained indirectly because of ethnic variations in educational achievement.

Certainly the considerable significance of the tribal variables in the series of equations and the striking differences between the coefficients for each tribe provided convincing evidence for the argument that kinship group powerfully influenced (positively in the case of the Asian and Kikuyu groups and negatively for all other tribes) the Kenyan individual's motivation to achieve, his qualifications for achievement and his chances of success. And in so doing, it immediately raised questions regarding the life chances of individuals emerging from the different tribes and established the necessity of measuring the extent to which differences in ethnic background affect the educational and career chances of individuals. From this point onwards it seemed as important to stress individual differences resulting from differential investments in education as well as differences resulting from family associations or associations with kinship groups.

The entry of the dummy variables for tribe, in equation (7) however, rendered the coefficients for all other variables unstable and indicated the presence of multicollinearity in the equation. The suspicion of multicollinearity between ethnic origin, family structure and education was followed up by formulating an equation in which (E) education achieved was presented as a function of the opportunities for and costs of human capital investments in the home.

$$\begin{aligned}
 E = & a_i + b_1 \text{AGE} + b_2 \text{SEX} + b_3 \text{TRIBE} + b_4 \text{SIBLINGS} + b_5 \text{BIRTH-ORDER} \\
 & + b_6 \text{MOTHER'S EDUCATION} + b_7 \text{FATHER'S EDUCATION} \\
 & + b_8 \text{FATHER'S OCCUPATION}
 \end{aligned}$$

Age, sex and ethnic origin were meant to capture time, sex and ethnic specific opportunities for investment in human capital. The effect of family structure on educational attainment was measured by the birth-order and number of siblings of the respondent. The opportunity cost of mother's and father's time input was captured by variables measuring the mother's and father's education. Father's occupation was additionally entered as a series of dummy variables meant to capture the economic status of the family into which the respondent was born. The regression coefficients of this equation (and the standard errors of each coefficient) have been presented in Table 4.6 below.

The results of this regression provide one with a modest but striking rationalisation of the strong effects of family background and tribal origin on schooling attainment. Dealing with the economic variables first, it was apparent that having an educated father or mother added(1.6 years)to the educational attainment of the respondent. Having a father who was self-employed or in a sales occupation

Table 4.6: Regression on years of schooling.
Coefficients of independent variables

Equation No (13)		
R ²	.35	
Constant	11.21	
Sex- Male	.649	(.262)
Tribe:		
Luo	+	
Coastal	+	
Asian	1.522	(.418)
Kamba	-.572	(.199)
Luhya	-1.050	(.188)
Age (years)	-.126	(.008)
Number of siblings	.097	(.028)
Birth order	+	
Father's education (years)	.161	(.030)
Mother's education (years)	.167	(.044)
Father's occupation		
None, casual, unskilled	+	
Blue-collar	+	
Self-employed, sales	.974	(.241)
Clerical, secretarial	+	
Mid, High-management	+	
Professional	+	
Landsize (hectares)	.021	(.009)

Source: Labour Force Survey, 1980

Note: + coefficients not significant
at 95% level and excluded in the
stepwise procedure of the
regression.

also improved a child's educational attainment.

And as expected, there was the differential effect of tribal origin on educational attainment showing up again. Belonging to the Luhya and Kamba tribes had a large negative effect upon educational attainment; membership of the Asian group added 15.2 years to schooling - or the equivalent of University entry. A dummy variable representing the Kikuyu tribe was included in the constant term. In sum it was possible to confirm that tribal origins had strong indirect effects on earnings via the schooling system, and this close and consistent relationship between ethnic origin and education - with education the most important determinant of earnings that could be discovered - testified to serious ethnic variations in career achievement resulting from differential schooling attainments among ethnic groups.

(b) Family Size and Birth Order

The most interesting result of the regression given in Table 4.6 was, however, the positive influence of family size, measured by the number of respondent's siblings, on his educational achievement.

The argument for looking at family size or birth-order normally obtains because it has been found in developed countries that men from small families enjoy an educational and career advantage over men from large families, regardless of sibling position, and that these differences persist, although in attenuated form, when social origins are controlled. This finding has had important demographic implications. In the context of developed countries,

the interactions between parental income, declining rates of return to incremental education, rising actual and opportunity costs of children etc. have often been used to explain the secular decline in fertility, the negative correlation between schooling and family size, the lower fertility and higher schooling of American Jews, recent declines in fertility and rises in schooling of American blacks, changes in rural-urban fertility differentials and the relationship between child mortality and fertility.

In view of the evidence given for Euro- American countries, we had looked to find a negative impact of family size (and birth order) on education in our regression. This result would indicate that (in Kenya) economic prosperity and a widening of urban opportunities would also be an effective contraceptive - a desirable result for a country with the highest fertility rate in the world.³

But the introduction of controls for birth-order and family size in the earnings function (equations 8-12 in Table 4.3) denied any direct influence on family structure on earnings. On the contrary there was the arresting finding (equation 13, Table 4.6) that larger families had a *positive* influence on educational attainment. The unexpectedness of these results, and their far-reaching demographic implications warranted some explanation.

In retrospect, the reason why birth-order did not prove to be directly significant in determining urban wage earnings, was easily found. Familiarisation with the data base revealed that the Labour Force Sample, although randomly selective of urban employees in 1980

3. See Table 3.5 above.

consisted largely (95.3%) of rural migrants, 64% of whom were first, second or third born siblings of their families, who had obtained higher educational qualifications than the rest of their peers (especially those lower down in birth-order than themselves) and had subsequently migrated to the city to increase their earning potential.

It was certainly expected that urban labour was predominantly migrant labour, and that the process of migration was selective of persons who had acquired more education than the community which they had left behind.⁴ The important and additional finding was that these highly-educated migrant individuals tended to be the early-born children of their families. Clearly the Labour Force Sample of employees, in containing such a large proportion of first-born children, had unwittingly controlled for birth-order and thereby rendered redundant the additional inclusion of such a term in a regression on earnings (or education). Moreover, as birth-order and education were positively inter-related characteristics, the bulk of such influence as birth-order might obtain, would operate with educational attainment as the intervening variable.

Why, however, did our findings indicate a *positive* influence of family size on educational attainment? (Equation 13, Table 4.6). We found the answer to this question in the information already obtained in the previous Chapter on rates of return to education.

Rates of return to human capital which are initially higher than on other assets, allow education to become the first channel for

4. See Remple H.; Labour Migration into Urban Centres and Urban Unemployment in Kenya University of Wisconsin, 1970, Unpub. Ph.D. Thesis. pp 30-34.

investment in children. And, of course, falling rates of return to increased investment in human capital (found in Euro-American studies) would mean that parents with scarce investment resources at their disposal would maximise their return by equalising human capital investments in their children - always assuming, of course that ability endowments are symmetrically distributed between siblings.

If maximising behaviour necessitates that parents equalise human capital investments between siblings, then the advantage of smaller families would lie in the fact that it would permit parents to equalise human capital investments at a higher level of schooling. A child who goes to school uses up parental resources if only by continuing to depend on their economic support instead of beginning to contribute to the support of the family. A higher education makes particularly great demands on the financial resources of the parental family for it generally requires substantial economic support for extended periods. As might be expected, given the necessity to spread financial resources for education over more offspring the greater their number, family size might have a pronounced negative influence on educational attainment. Smaller families might be expected not only to raise the mean educational attainments of children, but also the likelihood that they proceed with their education at most stages. Thus, income constraints, declining rates of return to education and maximising behaviour of parents would lead parents to move from low quality - high quantity children to high-quality low-quantity children.

But the foregoing analysis also suggests that if one of these parameters changes - if there are no income constraints, or if rates of return

to incremental education *rise* - the income maximising behaviour of parents will be different. The fact that Kenya has had rising rates of return to incremental education would have different and important implications with regard to the allocation of resources between siblings.

In Kenya, the prevalence of rising rates of return to incremental education means that as family size increases, the parental options for investment in education are either to share out the financial resources evenly among all children or to concentrate available investment resources on some children at the expense of others. If one hypothesises that parents in Kenya make investment decisions in such a way as to maximise future family income, then rising rates of return to schooling imply that the income returns from schooling will be maximised not by equalising educational investment in each child, but by concentrating investment resources on the education of the first-born children at the expense of later-born children. This asymmetrical pattern of resource allocation within a family - a predictable result of scarce family investment resources and rising rates of return to incremental education - means that the future educational and occupational chances of children are affected not only by the number of siblings they have, but also by their position among their siblings; indeed, these two factors (number of siblings and birth-order) are likely to interact in their effects upon education and income, and this interaction would account for our finding of a positive influence of family-size upon the educational attainment of first born siblings.

The data for Kenya, graphically presented in Figures 4.1, 4.2 and 4.3 provide strong evidence for such interactions, for the asymmetrical distribution of human capital resources between children, and for the generally favourable influence of family size on the educational attainment of low-parity siblings - which constituted the majority of our sample. On the whole, they show that as family size increases, the probability of completing any educational level also increases, but only for first-born siblings. Increasing family size depresses the educational attainment of middle and late-born siblings.⁵

Looking at each figure in turn, it is clear that where the completed family size is small - Figure 4.1 - the probability that a first-born child will complete primary education is 47.8%, compared with 30.7% for the second child, 11.4% for the third child and 10.0% for the youngest sibling. This can, of course, be shown in another (although graphically less pleasing) way: by indicating that mean educational attainments decrease with increasing parity.

Where the completed family size is intermediate (for Kenya, this constitutes a family size of 1-7 siblings, as shown in Figure 4.2) the distribution of resources is still in favour of the oldest siblings, but the differences in parental educational investments between groups are now much greater at all educational levels. The probabilities of completing any educational level are 64%, 32% and 4% for low-parity, middle-born and high-parity children respectively. Since the largest proportion of the Labour Force Sample was drawn from such families, the relationship is an important and a dominant one.

5. The author is grateful to Nigel Crook, School of Oriental & African Studies, University of London, for pointing out that one must control for completed family size in validating the relationship between educational attainment and birth-order.

Probability of completing any level of education.
%

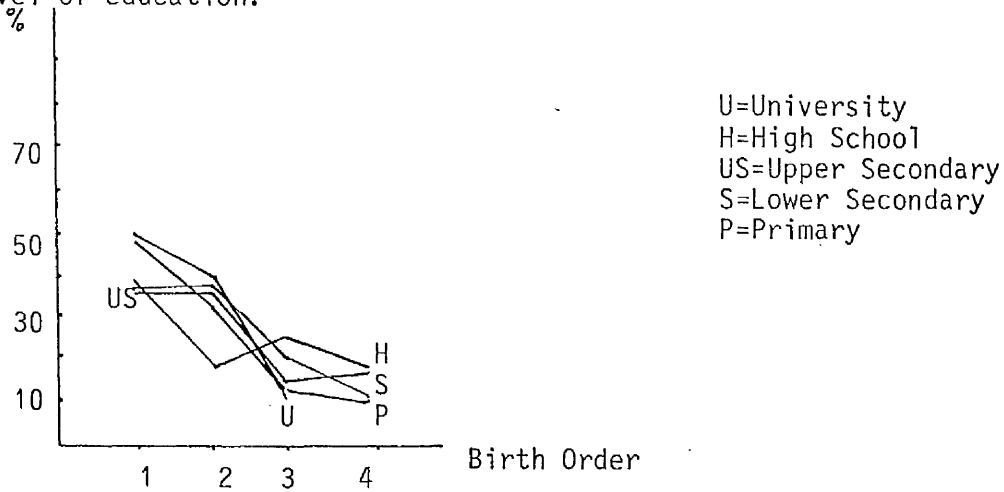


Figure 4.1 :Probability of educational attainment by Parity
Small families: 1-4 siblings.

Probability of completing any level of education.
%

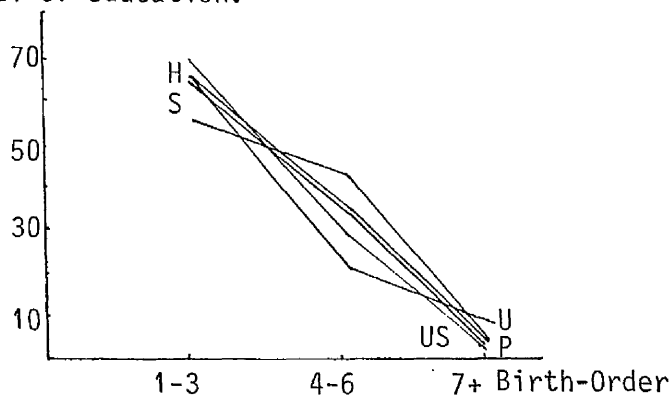


Figure 4.2: Probability of educational attainment by Parity
Intermediate families: 4-7 siblings

Probability of completing any level of education
%

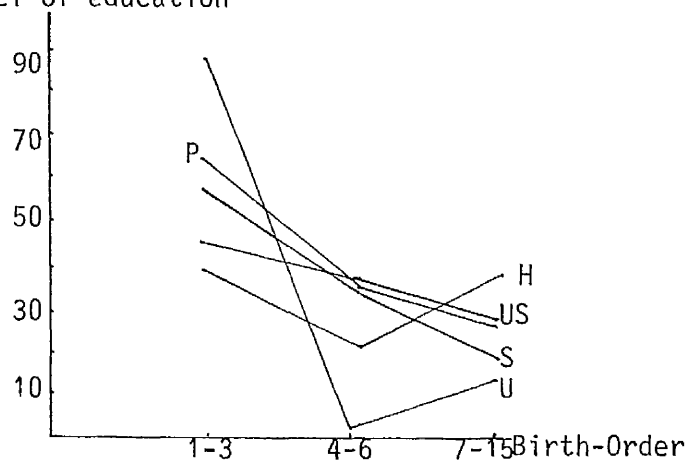


Figure 4.3: Probability of educational attainment by Parity
Large families: 9 siblings and over.

Finally, we come to Figure 4.3 where an interesting relationship begins to reveal itself. When completed family size exceeds 9 siblings, the first-borns are still better off in terms of educational attainments than their younger siblings; middle-borns are no worse off than they were before, but the balance is beginning to tip in favour of the youngest sibling. Indeed, the figure suggests that only in these very large families, the lower a child's position is in birth-order, the more does the balance of receiving help from his family (mostly older-siblings) turn in his favour, and the less disadvantageous it is therefore, to have many older siblings. To view it from a slightly different perspective, beyond a certain point in family size (and this may well relate to the birth-spacing of siblings, although we do not have data on this aspect) men in the two extreme positions are advantaged in the human capital resources invested in them, and this shows up in their asymmetrical educational attainments.

What is important about the foregoing analysis is that the asymmetrical differences in educational attainments become manifest not only in educational attainments but in consequent earned income achievements; the interpretation that suggests itself is that the future income interests of middle and late born children are to some extent deliberately set aside by utility-maximising parents in order to increase the probability that at least one of their first-born sons migrates and finds employment in the formal sector. Although the distribution of innate endowments among siblings will undoubtedly modify the skewness of educational investment, presumably parents will invest in first-born children because future family income is maximised at an earlier date.

One can imagine that as long as there is a significant correlation between education and earned income, and as long as the gains from investing in education are greater for men⁶, the family's decision to trade-off equity for efficiency in educational resource allocation between siblings actively promotes the educational attainments of first-born sons in order to increase their probability of migration to urban centres and their chances of finding urban employment.⁷

From their advantaged position in the urban labour force, these siblings might be induced by the family to compensate their younger siblings in terms of both human and non-human capital investments.⁸ The process may be recursive - the heavy flow of remittances from migrants being aimed at paying the school fees of the youngest siblings, which in turn stimulates further migration, as these siblings try to emulate the experiences of the first successful migrant cohorts. Indeed, the asymmetrical distribution of human capital resources within families not only acts as a spur to migration, but the homeward flow of remittances to families becomes

6. The same relationship between birth-order and educational attainment was found for females. But because female migration reflects male migration or employment patterns, because females often require a higher level of education than do men before a given proportion will migrate, and because females constituted only a small proportion of the total Labour Force Sample, the relationship was not statistically significant.

7. The process of migration, of course, transfers labour into occupations where its remuneration is higher. It may be important to mention that although increasing rates of return to education have an important effect in redistributing investment resources in favour of early born siblings, the propensity to migrate need not increase linearly with educational status. But insofar as part of the gain from substantial educational investment is a reduction in the amount of time spent unemployed, it could intensify the redistribution of resources towards early born siblings.

8. Moock, J.K., A Case Study of a Rural Village in Kenya: Pragmatism and the Primary School. Research Paper 135, Nairobi, IDS, March 1972, p.9

a means by which the success of one generation is consolidated by financing, motivating and facilitating the educational achievements and migration of the next. Possibly as more of the older siblings obtain employment in towns, a larger network becomes available to extended families; this 'social capital' probably improves the income returns to education and facilitates migration, given the importance of relatives in finding jobs and supporting relatives when they first come to town.

D. Conclusion

The overall findings of this chapter are unambiguous: educational attainment, performance in school and experience in the labour market are a much more important influence on earnings than ethnic origin or socioeconomic background. But kinship associations and family size and structure have a direct influence on educational attainment, and thus have a bearing upon earnings.

The coefficients of education and experience in the regressions on earnings are significant and relatively stable, even when the regressions take account of many other explanatory variables for which, in their absence, education might be suspected of being a surrogate. In the whole sample, the fraction of explained variance for education alone is approximately 28%, while the aggregate effect of education, examination performance and experience lies between 50% and 53%. Thus, over one-half of the variance in earnings can be explained solely by the volume of investment in an individual.

The second, and perhaps more important finding of this chapter is that the family structure, and kinship origin of the individual affects his future earnings by influencing his educational attainments.

Most of the influence of family structure on earned income is mediated by education - the direct effects of family size on earnings are negligible. Indeed, birth-order was rendered redundant as a regressor because the sample was skewed in favour of first-born siblings. Both parity and family size, however, considerably modify educational attainments. In the latter case, contradicting the experience of developed countries, the large family is actually conducive to earnings success of early born siblings through its positive effect on educational attainment and the propensity to migrate.

The task of raising many children evidently strains parental resources, with the result that the advantages of a higher education can go to only a few siblings. Rather than equalise educational resources between siblings, increasing rates of return to schooling permit parents to maximise the returns to investment by trading off efficiency with equity and promoting the educational attainments of early born children. The subsequent migration and employment of elder siblings in urban centres transfers their labour into activities where their productivity and remuneration is higher. At this point, the family induces a flow of remittances homewards for the purpose of compensating middle-born and late-born siblings for their educational disadvantages. It is likely that middle-born siblings will be compensated by the purchase of non-human capital investments, while the last born children will be compensated in

human-capital terms (schooling, health etc.) stimulating *in turn* their townward migration and consolidating, over time, the position of the family (and inevitably that of the kinship group) in the urban occupational structure.

The assistance which older siblings are induced to furnish toward their younger siblings introduces another asymmetry into the influence of the number of siblings on education. This asymmetry may be expressed by saying that having younger siblings is more disadvantageous than having older ones, because the older ones are called on to sacrifice some of their returns to education in the interests of their younger siblings. For the middle born and youngest siblings, there is a financial disadvantage to coming from a large family but the disadvantage of having to share parental resources with a large family is mitigated to some extent by the later contribution of the older siblings.

The extent to which one generation exerts economic power over another is not an area of much empirical research in Kenya. Among strong tribal and kinship groups, the fact that land, and the power associated with it, is not inherited by sons until the death of the father, permits the parental generation to exert a strong psychological and economic hold over the wage earnings of their children. This hold of the older generation over the younger, lowers the risk that children will prove to be ungrateful and will refuse to support their parents and siblings once they have achieved a position of advantage in the urban sector. This pattern is very different from the European-American experience where parents do not, on the whole, expect a financial return

from the education of their children. We suspect that one component in the utility function of parents (and that of the entire kinship group) which acts to reinforce the asymmetrical distribution of educational resources between siblings, is the high ability of parents to induce homeward remittances from eldest sons employed in the urban sector. The binding link between education, urban earnings and homeward remittances probably also makes the wider community more willing to (privately) finance the education of its offspring. For the benefits of that education will accrue not only to the individual in whom it is embodied, but will also benefit parents and younger members of the family.

Family size and birth-order notwithstanding, the wider implication of the analysis in this chapter, is that a positive orientation towards education in a family affects educational attainment, and through education, earnings success. Moreover, the asymmetrical distribution of educational resources within the family clearly implies that such resources are regarded as an investment (not a consumption) good. And it is the pertinent value orientation of education as an investment good that activates potential economic family resources and makes them serve conclusively as a tool for economic advancement of the family. Indeed, if education were regarded purely as a consumption good, educational attainments of children would not be consistently skewed in favour of older siblings, nor would later remittances to the family be aimed at paying the school-related expenses of younger siblings. Lastly, there is the clear implication that parents act to maximise not merely their own lifetime income but the expected future income of the family.

CHAPTER FIVE

ETHNIC DIFFERENCES IN SCHOOLING INVESTMENT

A. Introduction

The previous chapter has shown that wage income is primarily determined by cumulative investments in education which are strongly influenced by family structure and race. Parents maximise their own utility (loosely defined as a pool of family income) by choosing to invest scarce resources of the family in the education of their children, and rising rates of return to education ensure that parents will asymmetrically allocate their investment resources in favour of early born children. Hence the parity of an individual influences the quantity of educational investments made in him by his parents, and this in turn influences his chances of migration and his future wage earnings. Differential educational investments between siblings therefore result in *individual* differences in earning potential.

In this chapter we change gear to focus upon *group* inequalities in earning potential - a result, we suggest, of disparities between communities or ethnic groups in their pool of family investment resources and in their propensities to invest in education. We trace differences in these propensities to the distribution of preferences within populations and to the forces which maintain these and other ethnic boundaries. Simply stated, the question we inquire into is: What conditions permit tribes to differ in their tendency to invest in their offspring, and do these differences reflect fixed (exogenous) differences in preferences, or are they shaped by or interact with institutional or economic structures?

We argue that the increasing inability of the public sector to cope with the educational needs of a widening population base has had its effect in private community funding of the educational system. We hypothesise that the expanding private role in the allocation of schooling resources has increased relative inequalities in access and quality of schooling between geographical areas and kinship groups, because it has permitted those groups and families at the top of the socioeconomic structure - which groups appear to come from specific ethnic-geographical origins and have long perceived the private benefits of investment in education - to allocate their resources in education more efficiently, to make greater cumulative investments in education and to impart some of their inertia to the schooling system, thereby changing its efficiency, and allowing them to obtain higher rates of return to their investments in education.

The main thrust of the argument is that economies of scale to the schooling process (the unit costs of teaching 25 children being on the whole, lower than those of teaching 4 children) have translated the private family desire for investment in education into community action. In a free market, one would expect this action to be manifest in the development of private (fee-paying) schools for the children of the community. But the concurrent Governmental desire to abolish fees at the primary school level (and the consequent legal restrictions on the levy of fees) has necessitated community action of an alternative form. Richer sections of the population have been induced by the community to fund and support community projects, including schools, on a 'voluntary' basis. The

local community raises the funds to construct schools and teachers' houses, while the Government provides recurrent operating expenses for teachers' salaries and for some school equipment. Decisions on appointments of teachers are made by the Ministry of Education. The expansion of primary education therefore involves the building of community-funded, non-fee-paying schools, to which all children within the catchment area have right of access. But differences in the ability and willingness of local communities to impose levies on themselves for schooling development costs have resulted in wide variations in school quality.

We suggest that this method of financing education might have the following effects:

Firstly, making a comparison between communities, differences in the socioeconomic structure of each community would lead to community differences in the physical quality and teacher effectiveness of schools. The ability of some communities to induce more experienced teachers to stay with the school for long terms - by making such teachers part of the community or by providing them with better accommodation etc. - might have positive consequences on teacher effectiveness and hence on pupil performance. Highly effective teachers within a community school would lead to predictable differences in the scholastic attainments of community children, and to differences in income for the families within that community.

Quite apart from its effect on income, the coupling of the individual (or family) decision-making process with institutional effectiveness

would be an important finding, for it would suggest that some groups have been able to act collectively to impart some of their momentum to the social system. Thus the goals and effectiveness of institutional factors - in this case, schools - might be shaped by, and therefore become a product of, the orientations of the parents, culture and community surrounding the school.

Secondly, comparing socioeconomic groups within a community, the absence of economic segregation of pupils would permit the children of poorer families to advance themselves by raising their educational attainments to the level of their more advantaged peers. Over time, as these children found employment in urban centres, and as their families (and therefore the community) induced homeward remittances from successful migrant children towards the education of their younger siblings, the welfare of the family and community would be raised; indeed, the circular process - educational attainment, migration, remittances homeward - might perpetuate the income of the family from generation to generation. Naturally, the opposite effect would also hold: in poorer communities where the ability of families and the community to finance education has been restricted, the inability of the family-community to exploit its human capital potential would be perpetuated across generations.

In attempting to answer the question posed at the beginning of this chapter we decomposed it into its constituent elements: (1) are there tribal differences in propensities to invest in education? (2) are schools structurally different in the way they operate between communities? (3) are these structural differences between schools shaped by the socioeconomic structure of the catchment area?

The analysis is based on data collected from schools, school -children and their parents in three Provinces in Kenya, and its applicability is limited therefore to 3 tribes: Kikuyu, Mijikenda and Luo-Luhya who live in Central, Coast and Nyanza Provinces respectively. To answer the first question, we look at the present and past educational attainments of adult members of different tribes . In answering the second question, we develop what has become known as an 'educational production function'. The function itself is not as revealing as an analysis of its residuals, whose distribution enables us to separate schools into groups which are structurally different in the way they operate. Having separated primary schools by operating rates, we are able to establish whether schools of similar operating rates are clustered within communities of similar socioeconomic structures.

The presentation begins by placing the proposed analysis in historical perspective. This is followed by a description of the data base, and by an analysis and discussion of the findings.

B. Historical Perspective

In the effort of meeting its high-level manpower requirements and improving income distribution, expansion of educational opportunities has been a goal of the Kenya Government since independence in 1963. In attaining this objective, it has attempted both to increase the scale of educational opportunities and to eliminate pre-existing inequalities in educational attainment among the various social groups. The underlying assumption has been that equalising schooling opportunities and cognitive skills is a prerequisite to equalising status and income. However, as the inherited baseline positions of the different geographical areas and different ethnic groups were extremely varied -

a result of racial discrimination, missionary evangelism and the different ethnic responses to the colonial system - the task of reducing disparities in educational opportunities and achievement among races and between geographical areas has been a complex and expensive exercise which is yet to be completed.

Participation in the educational system, as measured by enrollment rates have, for example, tended to be higher than average in districts in which schooling facilities had been constructed prior to independence, where the population was relatively prosperous and earned cash incomes from the sale of crops or from wage employment, and where education was perceived quite early on as an instrument of economic advancement. Conversely, lower enrollments have consistently been obtained in districts with few schools, and with a poor or nomadic populace having little access to cash incomes, where networks of communication and amenities have been deficient, and where education has not appeared to confer long-term benefits commensurate with the investment entailed.

In the latter instance, these vast lands of poor resources and limited facilities comprise the whole of the North-East Province, parts of the Rift-Valley Province and the Coast Province of Kenya. Indeed, geographically, almost two-thirds of Kenya's total area can be included within these regions which are overwhelmingly rural in character. There are, perhaps, no comparable areas of the world, in which large, indigenous and relatively sedentary populations have shunned so persistently any form of nucleated settlement. Aside from ancient trading centres along the coast of

the Indian Ocean, Kenya had no urban centres until the latter half of the nineteenth century and consequently the pattern of economic development, urbanisation and educational development has closely followed the patterns of missionary activity and colonial settlement.

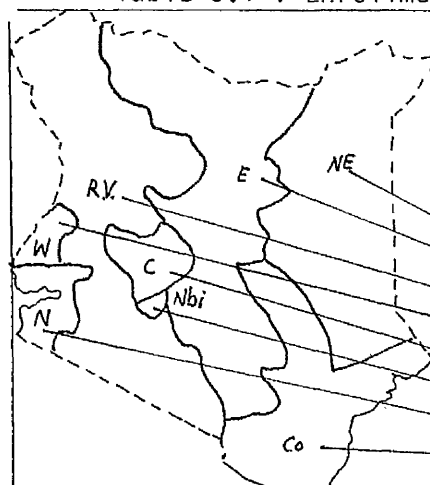
After independence, public response to the disparities in the provision of education facilities was directed towards increasing total spending on education and attempting to equalise the distribution of educational facilities by increasing educational development expenditure in 'low participation' areas. In 1974, school fees were waived for the first four years of primary schools and in 1978-9 this was extended to other levels of primary education. In addition to these policies, every year, increased proportions of development expenditures were meant to be directed towards the education of students of low-income families by way of compensating for disadvantages in their background. Boarding school facilities were provided even at the primary school level, and from 1973, school fees were often waived for children in pastoral or poor districts.

Yet, despite the accelerated programme of investment in education, the data in Table 5.1 below indicates that disparities in school enrollments have continued to persist.

Because low enrollment areas are also characterised by fewer schools, it is not possible to indicate how many of those children who do not attend school in low enrollment areas would do so if one

were available. In other words, it is difficult to separate the proportion of inequality due to variations in taste from those due to public provision of school facilities. Nor is it possible to say to what extent the differences between high and low enrollment rates reflect these differences in taste compared with differences in access. Both are involved to some degree, and probably interact with one another.

Table 5.1 : Enrollment rates and Number of Schools by Province



	Enrollments in primary schools as % of 6-12 age-group		No. of primary schools
	1973	1980	1979
RV	0.13	0.13	47
W	0.88	1.07	2110
N	0.77	0.93	1761
C	0.77	1.09	1248
Nbi	1.14	1.02	1158
E	0.87	0.74	124
NE	0.58	0.97	1173
Co	0.54	0.67	675

Source: Educational Trends, 1973-1977
Kenya Statistical Abstract, 1976 and 1981

Indeed, part of the reason for the continued inequality in access to schools between regions has been the existence of such interactions: the Government's attempts to secure equality in access to education were invariably overtaken in some (high-participation) areas by the construction there of additional facilities for schooling through community efforts inspired by the intense private desire for education. This unregulated (and encouraged) growth of private investment in education tended to alter the relative balance of development expenditure further in favour of the advantaged areas and consequently intensified the unequal distribution of educational

facilities. Yet, excluding private investments in educational facilities, it is clear that provincial claims to public funds for education have not been equal. Per-capita expenditures on education between 1974 and 1977 indicate that the highest development expenditures (i.e. excluding recurrent expenditures) were allocated to high participation areas and vice versa. Certainly one may conclude that the distribution of educational opportunities via public funds has not been such as would tend to eliminate pre-existing inequalities in access between Provinces.

Table 5.2 : Regional Inequalities in Educational Expenditures and in Teacher Quality

Province	Per capita recurrent expenditures 1973-74	Per capita development expenditures Secondary ed.	% trained teachers in primary schools
Central	4.98	0.53	85%
Nyanza	n/a	0.25	61%
Coast	1.62	0.15	56%

Sources: Educational Trends, CBS, Ministry of Economic Planning and Community Affairs.
Anne Bigsten: Regional Inequality & Development: A Case Study of Kenya, 1980.

Curiously, despite the accelerating expenditures on education from both public and private funds, the internal efficiency of different educational strategies has not been explored, even in high participation areas. What has been missing completely is an analysis of how differences in programme inputs have affected scholastic achievement and consequently economic advancement. The result is that additional public funds for education in low-

participation areas have continued to be expended in very traditional ways - on reductions in class size (teacher-pupil ratios) on increasing enrollment ratios and on expanding the total number of schools irrespective of their quality or effectiveness in improving student performance or continuation rates.

C. The Data Base

Against the background of these regional differences in the provision of and access to educational facilities, and in view of the apparent long-term effects of education upon earnings (seen in the previous chapter) we conducted a survey of schools in three provinces which would best represent different stages of economic development and intensity of interest in education.

Because ethnic origin has been closely associated with geographical origins, the options in choosing a sample which would adequately represent those tribes which, numerically, are the most important in Kenya (the Kikuyu and the Luo) were limited. In the event, we chose to focus upon education in three areas:

- (a) Kiambu District, Central Province - for the Kikuyu Tribes;
- (b) Kisumu District, Nyanza Province - for the Luo - Luhya Tribes;
- (c) Kilifi District, Coast Province - for the Mijikenda tribes. This area was also chosen for its low enrollment ratios and Moslem influences.

Within each district, the schools were selected randomly from a list of schools in the district. The sample was additionally stratified by size and type of school - primary, secondary and high school.

Altogether 1457 primary school students, 214 secondary school students and 51 high school students were covered in the sample. Information was obtained directly by interview and was recorded on questionnaires - a sample of which is reproduced in Appendix B.

Although the language of instruction in schools was English, we tried to eliminate the language response and interpretation bias observed in the pilot-study by allowing each respondent to elect for interview in any of the local dialects, as well as Swahili and English.

We needed a standardised measure of school output in order to compare school effectiveness and pupil operating rates between different schools, but because we could not develop a comprehensive measure of the total output of the educational system, we concentrated on a single aspect of this output - academic preparation for higher education.

In Kenya, all students in the seventh, eleventh and thirteenth year of school wishing to continue onto further education are bound to take the nationwide standardised examinations (CPE, 'O' Level(EACE) and 'A' Level(EAACE)examinations respectively) performance at which becomes the sole criteria for admission into further education. It must be emphasised that the primary level is the only level at which admission is not made on the basis of ability, but on the basis of geographical access to the school. At other levels of schooling, the use of examination performance as a selection device for admission into further education has had a profound effect upon school-content and job-selection.

However, because these examinations provide a standard measure of individual academic performance across schools and provinces, which eases comparability between schools and students, we chose to focus only upon students taking these examinations. Accordingly, in principle, all candidates due to take such examinations in the chosen schools were appointed an interview. In practice, because constraints of time and finance allowed us to visit each school only once, interviewees absent upon the day of interview were omitted from the sample.

For each individual student, information was obtained on a variety of factors: demographic background - age, sex, ethnic origin, number of siblings, birth-order, family size, number of adults living in the same house as the respondent, and the age, education and occupation of such persons; socioeconomic status - parental education and occupation, size of land-holding, cash-crop production, number of household utilities (electricity, piped water etc.) religion, religiosity; student motivation - details of the respondent's educational history and aspirations. Additional information was obtained from the parents of the students. Finally, for some students in each Province, parents were interviewed for information about the opportunity costs of sending the child to school - this information was used in calculating rates of return to education- see Chapter 3.

For each school, we obtained information on schooling inputs - development expenditures, recurrent expenditures on teacher salaries, school size, teacher experience, pupil-teacher ratios, repetition rates for the relevant examination. Interviews were held with the headmaster and all school teachers. Teacher salaries were later verified from the Teacher Service Commission in Nairobi.

Fieldwork was carried during 1979 and 1980 and, at the end of the academic year, the results of the examinations for the children interviewed were obtained from the Ministry of Education in Nairobi.

D. Findings:

(1) Ethnic Propensities to Invest in Education

The distribution of ethnic and regional preferences in educational investment can be considered together as they are so closely linked. Indeed, it is well to establish this link at the outset, and to this end, the concentration of many of the ethnic groups in a single province have been presented in Table 5.3 below:

Table 5.3: Per Cent concentration of ethnic groups by Province.

Province	Ethnic Groups						
	Kikuyu	Luo	Luhya	Kamba	Kisii	Meru	Mijikenda
Central	60	-	1	1	-	1	-
Coast	1	2	2	11	-	1	97
Eastern	2	-	-	78	-	97	-
N-Eastern	-	-	-	-	-	-	-
Nyanza	-	84	3	1	87	-	3
Rift Valley	28	3	9	2	2	1	-
Western	-	3	79	2	10	-	-
Nairobi	9	8	5	7	1	-	-
Total	100%	100%	100%	100%	100%	100%	100%

Source: Kenya World Fertility Survey 1977/8

Thus, over 95% of Meru/Embus, Mijikenda and Kalenjin tribes reside in the Eastern, Coastal and Rift Valley provinces respectively; about 80% of Luos, Luhyas, Kambas and Kisiis live in Nyanza, Western, Eastern and Nyanza provinces respectively. Only the Kikuyu with 60% in Central and 28% in the Rift-Valley are dispersed across provincial boundaries.

In terms of regions, the Coast is dominated by the Mijikenda (60%) with a significant Kamba minority (16%) and Nyanza by the Luos (67%) with a large Kisii and Luhya component, and Central Province by the Kikuyu. Since within our sample, ethnic concentration by region was much higher - 92% of all Coast respondents were from the Mijikenda tribes (4% Kamba and 4% other groups), 92% of Nyanza respondents were Luos (5% Luyhas) and 100% of respondents in the Central Province were Kikuyus - any reference to regional characteristics and inequalities inevitably reflects tribal variations in the same characteristics and vice versa.

We begin looking at ethnic propensities to invest in education by showing associations between adult education levels, occupation and income levels and religion - all of which are of particular interest in comparing ethnic groups, as these factors may be a major determinant of attitudes and behaviour, particularly with respect to investment in education.

The data in Table 5.4 below reveal variations in these characteristics which should be borne in mind when the main findings are reviewed later.

Table 5.4: Educational & Occupational Status of Adults by Ethnic group and Province

Tribe- Region of Residence	Average Education of Adults		Average occupational status - Men*
	Women	Men	
Kikuyu Central Province	4.8 yrs	6.4 yrs	7.6
Luo Nyanza Province	3.2 yrs	5.0 yrs	5.6
Mijikenda Coast Province	1.5 yrs	3.6 yrs	4.9
Kamba Coast Province	0.5 yrs	3.7 yrs	3.8
Luhya Nyanza Province	4.5 yrs	6.4 yrs	7.7

Source: Schooling Survey 1979-80

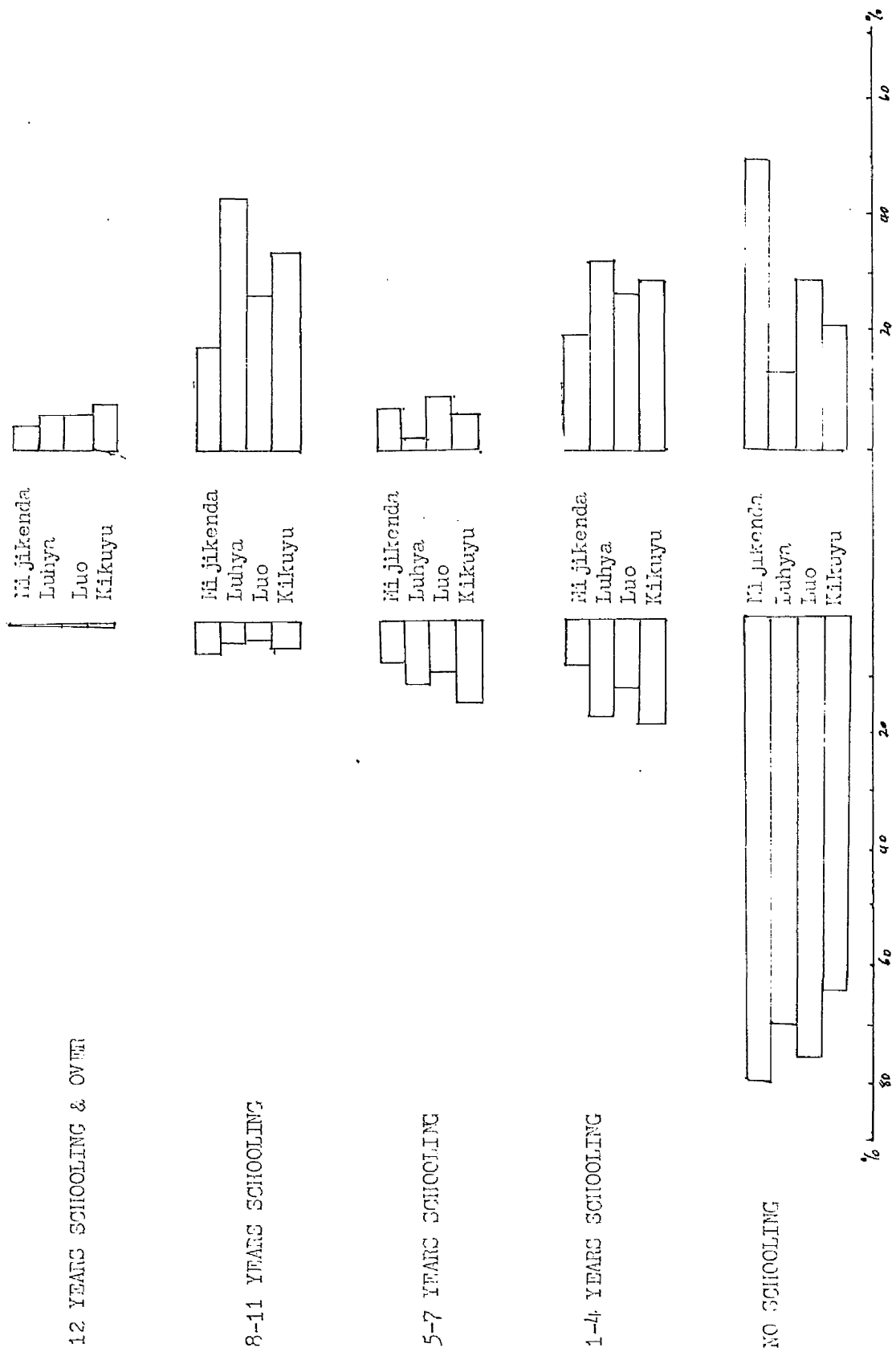
* Note: See Chapter 6 Table 6.1 for occupational ranks.

Clearly at the time of the Schooling Survey in 1979-80, adult members of tribes within the Coast province, predominantly the Mijikenda and Kamba tribes, had acquired far less education and occupational status than any other group surveyed and the differences were particularly pronounced for women, the majority of whom had received no education at all.

Figure 5.1 below, which presents the educational achievements of the various tribes between 1969 and 1979-80 clearly expresses the comparative and increasing educational inferiority of the Mijikenda tribes in relation to other tribal groups. Starting in 1969 from the same educational base as other tribes, by 1979 the Mijikenda had clearly lost ground. Half of their number had received no schooling at all, compared with 21% for the Kikuyu, 29% for the Luo and 13% for the Luhya. And these relative differences in educational attainment were present at all the higher levels of schooling. Compare this performance with that of the Luhya, who were the most highly educated tribe by the end of the decade.¹

Insofar as education has been associated with occupational achievement (and the data reveal a correlation of .49 between completed education and occupational status) Table 5.4 above also indicates that the educational handicaps of the Mijikenda have been translated into lower occupational attainments. Thus the Kikuyu, Luo and Luhya consistently achieve higher occupational status than the Mijikenda (and Kamba) from the Coast Province.

1. These figures are supported by the findings of the Kenya Fertility Survey, 1977-8. Their findings (Table 3.6) were that Kikuyu, Kamba, Luhya were the best educated tribes, followed by Luo and lastly the Mijikenda.



Source: Census 1969
 Schooling Survey 1979

Figure 5.2: Percentage distribution of Ethnic groups by Educational Category.

Controlling for region of employment, however, the Table below reveals interesting variations in occupational status obtained by the various tribes. When the Mijikenda (and Luo) migrate to work in areas other than their region of origin, their mean occupational status increases. In the case of the Mijikenda it increases directly with distance from origin. Only for the Kikuyu does the correlation between distance migrated and occupational status attained work in the opposite direction, but this is probably because the Kikuyu are the only tribe who live close to the metropolis, and therefore need only migrate when they cannot find work in Nairobi or Central Province.

Table 5.5: Occupational Status and Average Earnings of Male Employees by Ethnic Origin

Ethnic Group	Occupational Status*of male employees, 1980			Average earnings (KSh per month)
	Mombasa	Kisumu	Nairobi	
Kikuyu	7.0	7.1	8.5	1529
Luo	7.1	5.7	7.2	1574
Luhya	9.7	7.6	6.4	952
Kamba	3.5	13.0	6.4	1048
Mijikenda	4.9	6.4	8.8	1289

Source: Labour Force Survey, 1980 and Schooling Survey 1979-80

* See chapter 6, Table 6.1 for occupational ranks.

Table 5.6: Mean monthly Salary by occupational Category - adjusted for education and social origins

	Occupational Category			
	Lower Blue Collar	Skilled blue Collar	Lower white Collar	Upper white Collar
	(KSh. pa)	(KSh p.a.)	(KSh p.a.)	(KSh p.a.)
Mijikenda	532	1026	1615	n/a
All other tribes	688	1110	2410	6101

Source: Earnings Survey 1980

In Nairobi, despite the fact that the Mijikenda attain the highest occupational status among the migrant groups being compared, their

income clearly does not correspond with this status. The important fact is that even when their lower social origins and education have been taken into account, both the occupational achievements of the Mijikenda and their average income by occupation are inferior to that of the other groups. In the lower white-collar category for example, they receive approximately Sh. 800/- per month less than the average income for the other groups in that occupation. One important implication of this finding is that education and occupational status does not produce the same benefits for all, when benefits are measured in terms of income. And this inequality would tend to reduce the rates of return to educational attainment for the Mijikenda compared with the Luo and Kikuyu, even if schooling costs were identical across provinces.

One final feature distinguishes the Mijikenda from all other tribes considered. Persons of the 'moslem' and the 'no-religion' category are quite different in socioeconomic characteristics from the two other religious groups (Catholic and Protestant) in Kenya. Moslems are geographically concentrated in the Coast Province (70%) and the majority of all Kenyan moslems belong to the Mijikenda tribes. Moreover, persons reporting no religion at all are found predominantly at the Coast and the majority of these are also Mijikenda.²

One of the features of moslems and persons with no religious belief, in contrast to Christians in Kenya, is their low level of educational attainment (particularly among the women) - due in part to the fact that less missionary activity, and therefore fewer mission schools were established in the Coast Province than any other.

2. Kenya Fertility Survey 1977-1978. Central Bureau of Statistics, Ministry of Economic Planning & Development. (Nairobi: Government Printer) 19

To the extent that formal schooling changes attitudes and behaviour, these persons may be expected to be more traditional in their outlook and behaviour than others.

In sum, when we link the socioeconomic characteristics of adult Mijikenda with the enrollment ratios of their children (Tables 5.1 and 5.4) it is hardly surprising that their children have less access to education than members of the Luo and Kikuyu tribes. Since capital expenditure on primary schools is currently the private responsibility of local communities, the number of primary schools in the different provinces reflects both the inclination and ability of communities to raise the necessary capital to finance the education of their offspring. This places prospective students within the Coast Province at a particular disadvantage: they have lower social, educational, occupational and income origins than their peers within the other communities studied, and the imbalance tends to be self-perpetuating. For the fact that the Mijikenda obtain less income rewards (than the Kikuyu and Luo) for their educational investments robs them of an important incentive to incur these costs and indeed to make the serious sacrifices that doing so entails for persons from the underprivileged socio-economic classes.

(2) Are schools structurally different in the way they operate between communities?

Having established so far the argument that there are cultural variations in the propensity to invest in education, propensities which almost certainly are the product of labour market inequalities in the distribution of rewards, we turn in this section to

the next question, which can be decomposed into two elements: are there unusually effective schools, and are these unusually effective schools geographically clustered across communities or ethnic groups in Kenya? The answers to these questions were felt to be important because the cumulative impact of such schools in contributing to inequalities of income could be quite large, particularly in view of the fact that rural schools tend to be racially distinct. The high correlation between region and ethnic origin is expressed in the finding that all the pupils and teachers in any rural school tend to come from the same broad kinship group, and this exclusiveness is a by-product of the 'free-market'.³

If one speaks of schooling effectiveness, however, two questions can be posed: firstly, in terms of what criteria can one measure the 'effectiveness' of schools, and secondly, having identified these criteria, are there unusually effective schools? - i.e. schools which perform consistently better than others even when non-school backgrounds of students and random variations are accounted for?

Logically, one might begin by defining school outcomes. Schools produce a number of cognitive and non-cognitive qualities in their students and the outcomes will depend on the weights schools give to the various outputs and their relative efficiency in production. A substantive problem in measurement of total output lies in the fact that it is difficult to measure non-cognitive abilities, and we

3. There were only two exceptions to this rule in our survey: 4% Kamba children in Mijikenda Schools, and 5% Luhyas in Luo schools.

therefore defined a school's quality strictly in terms of its effectiveness in boosting cognitive abilities, as measured by examination scores.

Despite this narrow definition, however, it was evident even in the process of collecting data, that schools differed in their outcomes. Both the personnel involved in their management and the purchasers of the product acted as if some schools produced a superior product. And, indeed, some schools had consistently higher achievement scores, and more secondary, high school and University bound graduates. But these results could not be attributed solely to the schools themselves. Pupils would bring different amounts of intellectual capital to their schools in the form of different innate, social and economic characteristics. It might be expected that schools with more 'advantaged' pupils would tend to achieve superior results.

The educational system could therefore be viewed as a production process in which, simplifying greatly, academic performance was portrayed as a function of intelligence (B for brains) and deligence (C for concentration and concern). Which is merely to state that output was hypothesised to vary directly with capacity and operating rates. But either capacity and/or operating rate could be influenced by home and school technologies. Thus

$$\text{School Achievement} = f(B, H, S)$$

where H was home technology (socioeconomic status, parental education and occupation) and S was school technology (teacher proficiency, etc). In some respects, the data we collected for use in the measurement of such an equation was superior to that normally available for

estimating industrial functions; the data was at the 'firm' level and accordingly the problem of making technological inferences from national or aggregated data was avoided. Moreover, the inputs could be measured directly in physical or non-monetary units and ample data could be collected on other factors of production - teacher experience etc.

One was, however, deprived of the usual interpretation of the estimated parameters of a production function - a relationship which predicts the maximum output consistent with a given set of inputs. To the extent that school administrators - at least at the primary school level - are normally subject to a wide variety of political and legal constraints, and are not themselves fully knowledgeable about the underlying production set, it was not possible to assume that administrators were able to select their school inputs so as to maximise any measure of school output. And there was, moreover, no apparent incentive that would spur the firm to be technically efficient.

Rejection of the optimising decision model suggested that the observations upon which the estimates are based were representative only of an average, not a technically efficient frontier for schools, and this limited the analytic usefulness of the function in terms of a foundation for national public policy. But what we were reaching for in speaking of unusually effective (or inferior) schools was knowledge of the extent to which operating rates and capacity of children was directly affected by different school technologies and/or home procedures, whether some school technologies were more efficient in increasing value added than others, given the

same inputs, and therefore, whether unusually effective schools could be said to exist.

The second problem in estimation arose because inputs, when known, were not defined in terms of observable magnitudes and there were no proper measures to implement them. Reliance on achievement data as a measure of school output was not merely the result of data availability, but the result of a concern that achievement scores represented some valid school objectives. In our study, we were fortunate in being able to say that examination scores were a valid criteria of school output because progress from one level of schooling to another is so dependent upon performance in such examinations. But test results are only one part of the story. The use of conventional indicators such as teacher experience, or teacher credentials to measure teacher proficiency, and parental education or parental occupation to measure the quality of educational environment at home were clearly inadequate. And even with regard to physical inputs, there were problems in measurement. In the course of data collection, it was observed that there was considerable variation both between and within districts in the quality of physical facilities provided in schools. With increasing distance from urban centres, school structures tended to be of a semi-permanent nature, built of mud or wattle (rather than brick or stone) with no (or less) drainage or sanitary facilities. Moreover, the poorer the catchment area from which the students were drawn and the less educated its residents, the less able and willing was the community to raise the costs of development expenditures. In some parts of the Coastal Province, some of the schools visited in the course of data collection had no roofs, doors or windows, were flooded during the rainy season

and the children, who often sat against the retaining walls for shelter and instruction, were absent from schools for reasons of illness (malaria, dysentery etc.) more frequently and for periods of longer duration than children from higher-income communities. Although we obtained data on private development expenditures, the methods of accounting varied considerably between schools and this made it difficult to objectively assess the true costs of development expenditures for each school.

A final difficulty which plagued estimation of the function was the absence of a variable measuring the innate intelligence of each child entering the production process. And without this measure not only was it impossible to say precisely to what extent home or school inputs made a unique contribution to output, but the estimates we obtained would be biased upwards. In this regard, we were forced to make two important assumptions. Firstly, we assumed that selection for entry into primary schools was not made on the basis of ability. Secondly, we assumed that ability was randomly distributed across populations and therefore unlikely to alter the mix of innate inputs within each school.

The first of these assumptions was quite realistic. Apart from a few private schools, (mainly urban) admission into primary schools is made solely on the basis of geographical access, not on the basis of ability. Indeed, the institution of 'free' primary schooling gives a rural child the right to a primary school place within his catchment area. Therefore unless the ability of pupils from particular geographical areas (and therefore ethnic groups) was genetically determined, there was no reason to suppose that the ability distribution

of children entering primary schools was skewed in favour of one region or another. And this assumption of random ability distributions across schools allowed us to conclude that when some schools were more effective at boosting test scores than others (holding non-school factors constant) they were, by implication, also more efficient at tapping innate student capacity, and affecting operating rates than other schools. By contrast, less effective schools could be held to under-utilize the intellectual potential of their students.

Findings

Because we intend to discuss the residuals from the regressions rather than the effects of the regressor variables themselves, the regression results are reported here only briefly.

The dependent variable in the first equation tried was a composite of scores of various tests in English, Mathematics and General Knowledge taken for the CPE primary school examination. The background variables - father's and mother's education (FED and MED respectively) father's occupation (as a series of dummy variables for each skill category) land holding size and ethnic origin were used as proxies for genotype and family wealth. Higher educated parents were thought to inject a higher quality of time input and more encouragement into the educational development of their children. Ethnic origin was expected to constitute a logical measure of expected returns to education - in view of the compelling evidence given in the previous chapters that the economic returns to schooling are lower for the Mijikenda and Kamba tribes than for other groups.

Demographic variables - sex, age, family size (number of siblings) and birth-order were included because of their suspected influence

on motivation to achieve and their observed effect on educational attainment. Children from large families might get a different time-input from their parents than children from small families, a time-input which might be modified by the birth-order of the child.

Table 5.7 below presents estimates of the function, using variables thought to capture the richness of the learning environment at home and at school. In all cases the log-linear form of the equation proved superior. It must be noted that the estimated parameters and their signs were consistent with expectations; all coefficients given in the table are significantly different from zero at the 99% level.

Thus age, association with the Mijikenda and Kamba kinship group, unemployed status of the father, and poor health of the respondent had negative influences on achievement, whereas parental education and repetition of the primary examination and regular attendance at school had a positive effect. It was also interesting to find that among the variables we used, the sex of the child was the single most important factor influencing achievement; being male consistently raised the achievement score by 16% and explained about 6% of the variance in scholastic achievement.

When a number of school environment factors thought to influence learning were introduced into the model (teacher-pupil ratios, class-size, teacher experience and salaries etc) only one of these - teacher experience - was significant in explaining scholastic achievement. The effect of teacher experience was not surprising

TABLE 5.7: Regression coefficients of independent variables.
Dependant variable - log achievement score.^A

R ²	.187	.247	.273
CONSTANT	193.54 (12.59)	4.732 (.105)	5.18 (.0776)
DEMOGRAPHIC VARS:			
Male	26.46 (2.19)	.166 (.0133)	.1561 (.0132)
Age	-3.31 (.715)	-.0215 (.0044)	-.0234 (.0043)
Siblings - none	-	-	-
3-4	-	-	-
5-6	-	-	-
7-8	-	-	-
9-10	-	-	-
11-12	-	-	-
13+	-	-	-
Tribe - Kikuyu	-	-	-
Luo	-	-	-
Mijikenda	-16.16 (2.12)	-.0757 (.0138)	-.1486 (.0151)
Asian	-	-	-
Kamba	-17.35 (7.44)	-	-.1905 (.0462)
Luhya	-	-	-
SOCIOECONOMIC VARS:			
Mother's education	-	-	-
Father's education	.728 (.265)	.00254 (.00162)	.0062 (.0016)
Father's occupation:			
None	-14.48 (4.63)	-.0975 (.0282)	-.0893 (.0291)
Casual	-	-	-
Unskilled	-	-	-
mason, carpenter	-	-	-
Driver	-	-	-
Plumber	-	-	-
Electrician	-	-	-
Mechanic	-	-	-
Machine-operator	-	-	-
Foreman	-	-	-
Self-employed	-	-	-
Other skilled	-	-	-
Sales	-	-	-
Clerical	-	-	-
Typist, secretarial	-	-	-
Mid-management	-	-	-
High-management	-	-	-
Teacher	-	-	-
Architect	-	-	-
Medical	-	-	-
Agronomist	-	-	-
Statistician	-	-	-
Scientist	-	-	-
Lawyer	-	-	-
Accountant	-	-	-
Farmer	-	-	-
Rural work	-	-	-
Highest education in family	1.93 (.439)	.0119 (.0027)	.0122 (.0026)
Landsize	-	-	-.0016 (.0008)
Utilities	-	-	-
Religion: Moslem	-	-	-
Christian	-	-	-
Catholic	-	-	-
Other	-	-	-
Religiosity	-3.87 (1.627)	-	-
Respondent's health	-10.46 (2.51)	-.0381 (.0162)	-.0559 (.0152)
Attendance at school	-	.432 (.0649)	-
Repetition of exam	-	.129 (.0172)	.1058 (.0159)
Personality score*	-	-	.0007 (.0001)
SCHOOLING VARIABLES:			
Pupil-teacher ratio	-	-	-
Teacher experience	-	.0059 (.0020)	.0078 (.0021)
Teacher salary	-	-	-
Development expenditure	-	-	-
Index for school facilities	-	-	-
Class-size	-	-	-

A Standard errors of coefficients are given in parenthesis.
* Personality score - this was based on a peer-assessment personality test as described in

since teacher quality was expected to be the single most important school input. But its coefficient suggested that it explained less than 1% (0.05) of variance in achievement. In addition, it was interesting to find that there was a very weak relationship between teacher salaries and scholastic achievement, and teacher salaries and teacher experience. In situations where inputs are priced in the market, ostensibly on the basis of their competence or contribution to production, factor prices are theoretically a valid measure of factor product in the equation. Rejection of the market price for teachers in favour of the cruder measure of 'teacher experience' in the stepwise procedure of the regression, clearly suggested that the market price did not reflect the marginal product of teacher inputs. And indeed, in view of its low coefficient, it was doubtful whether teacher experience on-the-job adequately captured such product either. But, of course, as we mentioned earlier, teacher-salaries are not the only form of reward to teachers. We noticed that there were various forms of remuneration, not least of which was the standard of accommodation provided by the community to teachers and the honour and prestige accorded them within the community etc. And none of these rewards could be measured by us in any accurate way.

Finally, we note that the total explained variance of the equation was very small. This was not unexpected given in the crudeness of our measures and it pointed to a general failure to adequately specify a model of learning achievement.⁴ In addition to poor measurement of variables, we undoubtedly omitted important influences such as innate ability on learning.

4. The failure applies to a great deal of work done on education production functions. See, for example Coleman, James S. *et al.* Equality of Educational Opportunity. Washington D.C.:US Government Printing Office, 1966.

In sum, the unsatisfactory nature of our results stemmed from three problems: (a) firstly, the home and school variables we used failed to capture the richness of environmental processes relevant to learning; (b) secondly, we omitted variables such as pupil ability which rendered the equation subject to specification bias;

(c)thirdly, the equation was relevant to achievement at one point in time, while scholastic performance is normally the cumulative result of present and past inputs; and

(d)we did not account for significant qualitative differences in school environment between and within schools.

The first two of these problems were intractable and clearly called both for detailed case studies of actual classroom and home interactions, and for suitable measures of ability. The third problem - the use of contemporary input measures - was not particularly serious because of the low mobility of children within our sample. All our respondents had remained within the same school throughout their education. Thus both the home and school environment could be assumed to have remained relatively stable over time.

We turn therefore, to the last problem, which arose because of qualitative differences between schools. It was hypothesised that teacher and administrator attitudes and expectations and community effects on these attitudes might be different for each school, with predictable consequences on pupil achievement. Basically the problem was one of establishing and separating schools by efficiency or operating rates, which rates would influence the quality of their output. As long as some schools of different operating

rates existed, and could be identified, there was hope of replicating the technology of the effective school throughout the educational system, and most particularly in 'deprived' areas. Moreover, the cumulative impact of such schools in contributing to inequalities in earnings could be quite large.

The contribution of some schools to inequality in educational performance and educational attainment, will depend on the extent to which students who start with similar advantages in ability and home background are sent to schools which are unequally effective in advancing test scores at the end of primary school. If, other things being the same, some students enter unusually effective primary schools which induce a high proportion of their students to go on to effective secondary schools, and if these secondary schools in turn promote entry into effective high schools and then to University (and consequently a high occupational status) then the cumulative impact of the educational system will be quite large (even though the educational impact of a single year is quite small) because of the long-term impact of such schools on earnings.

If, on the other hand, a student goes to a primary school which is not effective (or less effective) at boosting test scores and consequently is less effective in promoting entry into secondary and higher levels of schooling, then the cumulative impact of the educational system, at least in terms of the returns to investment, will be relatively small. It was necessary to establish whether the lower returns to educational investment for the Mijikenda was partly a result of their lower-quality schools.

It was possible to test the hypothesis of structural unity within the sample of schools, by separating schools according to some criteria of quality and regressing non-school factors on achievement scores, using dummy variables for school quality.⁵ Such a regression was completed and it was found that the three groups into which we divided the schools differed significantly from each other at the 99% level. The results of the regression are given in Table 5.8 below.

Table 5.8: Regression coefficients of independent variables.
Dependent variable, log achievement score.

R ² :	.314	
CONSTANT	4.60	(.105)
Low quality schools	-.1430	(.015)
High quality schools	.1028	(.017)
DEMOGRAPHIC VARS:		
Male	.1640	(.012)
Age	-.0191	(.004)
Tribe:Kikuyu	-	
Luo	-	
Mijikenda	-	
Kamba	-	
Luhya	-	
SOCIOECONOMIC VARS:		
Father's education	.0046	(.0015)
Highest ed. in family	.0096	(.0026)
Father's occupation		
Unemployed	-.0779	(.0269)
Farmer	-	
Manual worker	-	
Skilled worker	.0757	(.033)
Clerk	-	
White-collar	-	
Landsize	-.0024	(.0008)
Religion		
Moslem	-.440	(.018)
Catholic	-	
SCHOOL VARS		
Respondent health	-	
Attendance at school	.4732	(.058)
Per-pupil expenditure	-	
Teacher salary	-	
Teacher experience	.0117	(.0019)
Repetition of exam	.1304	(.016)

5. See Damodar Gujarati, "Use of Dummy Variables in Testing for Equality between Sets of Coefficients in Linear Regressions: A Generalisation" *The American Statistician*, Vol 24, No.5 (1970) pp 18-21.

Two points are of immediate interest: Firstly, the different slopes to school quality dummy variables uphold the structural divergence hypothesis. Secondly, the proportion of explained variance increased with the addition of these dummy variables from .273 to .314 and the greatest proportion of explained variance was given now by the school quality variables. The coefficients to the other variables remained relatively unchanged.

The results of the regression did not provide irrefutable evidence that schools differed in their technology, but provided a good starting point from which to examine the residuals from a regression of school achievement scores on non-school background factors.

Histograms of residuals allow a visual inspection of 'lumpiness' in their distribution and of unusual tails. Lumps indicate that groups of students are massed together in a discontinuous fashion by schools - a clue that different schools have different educational technologies or procedures. (We are assuming, as we have done in the previous regression, that the distribution of ability is random among schools, although as we shall show, the distribution of socio-economic and ethnic status is not). A thick tail stretching out to three or more standard deviations above the mean is evidence that some schools are extremely high achievers. Neither lumpiness nor unusual right tails constitute conclusive evidence of anything, but they provide indicators of schools upon which to concentrate attention.

We had no data to construct a series of distributions for schools over many years - which series would show the effects of random

variation. We did, however, obtain the mean residual for each school for the year 1979, and could separate the schools into three categories: schools with mean residuals significantly above zero, schools with residuals significantly below zero and schools with residuals not significantly different from zero at the 95% level. Thereafter we tested for the existence of structural differences between each category. In the event that the data belonged to two or more structures, the true regression coefficients for the different structures would be different, and the coefficients estimated from the unified sample would not be reliable for all structures. Using the Chow test⁶ we confirmed that the samples were drawn from three different structures at the 95% significance level. The regression coefficients for non-school background factors and all factors for each different structure are presented in Table 5.9 below.

Table 5.9: Regression coefficients of independent variables for two categories of school quality. Dependent variable, log achievement score.

	High Quality Schools		Low Quality Schools	
R ²	.293	.401	.380	.380
CONSTANT	5.33 (.187)	4.53 (.245)	4.92 (.118)	4.92 (.118)
Age	-.0536(.009)	-.0413(.009)	-.0278(.008)	-.0278(.008)
Male	.186(.027)	.186 (.026)	.1354(.028)	.1354(.028)
Tribe:Kikuyu	-	-	-	-
Lus	-	-	.172(.029)	.172 (.029)
Mijikenda	-	-	-	-
Kamba	-	-	-	-
Luhya	-	-	-	-
Father's occupation				
None	-	-	-.144(.054)	-.144(.054)
Farmer, rural	-	-	-	-
Manual labour	-	-	-	-
Skilled blue-coll	-	-	.192(.093)	.192(.093)
Clerical, lower	-	-	-	-
white-collar	-	-	-	-
Upper white-coll.	-	-	-	-
Highest education in family	-	.116 (.057)	-	-
Religion: Moslem	-	-	-	-
Catholic	-	-	-	-
Landsize	-	-	-	-
Father's education	-	-	.007(.003)	.007(.003)
Respondent's				
health	-	.097 (.047)	-.099(.038)	-.099(.038)
attendance at sch.	.617(.147)	.5241(.147)	.360(.145)	.360(.145)
repetition of exam	-	-	.152(.034)	.152(.034)
School: pupil-teacher ratio	-	-	-	-
teacher salary	-	.001 (.001)	-	-
teacher experience	-	.015 (.003)	-	-
Expenditure per pupil	-	-	-	-
All coefficients significant at 95% level.				
- variable included but insignificant in the regression.				
Removed in the stepwise procedure.				
Standard errors given in parenthesis.				

Within the schools categorised as 'high achieving', when no school factors were entered into the equation, approximately 29% of variance could be explained by just three variables - sex, age and attendance rate at school. When schooling variables were included, the predictive power of the equation rose to .40 but, as before, no socioeconomic factors proved significant in explaining achievement. Thus the stratification of the analysis by quality of school appeared to have entirely eliminated the predictive power of home environment in the case of pupils going to 'high achieving' schools, and this phenomenon led us to suspect that home environment backgrounds of students in such schools were relatively homogeneous.

Within 'low achieving' schools, by contrast, all the explained variance in achievement was given by demographic and cultural/socioeconomic factors - tribe, parental education and occupation. These variables were significant whether or not school variables were included in the equation. Thus for example, whereas a child of a father who was unemployed tended to under-achieve by 14%, a child of a father within a skilled occupation improved his achievement by 19%. School variables were not significant. One was drawn inevitably to the conclusion that because students from high quality schools had homogeneous backgrounds in the higher socioeconomic strata, whereas students in low quality schools did not, a stratified analysis by school quality rendered redundant any measure of socioeconomic status in the former but not in the latter case.

(3) Are Highly Effective Schools Geographically Clustered?

Analysis of the raw data set allowed us to confirm the strong association between quality of school and socioeconomic characteristics of the

6. See Gregory C. Chow, "Tests of Equality between Sets of Coefficients in Two Linear Regressions," *Econometrica*, Vol.28, No.3 (July 1960), pp 591-605

catchment area of the school. Highly developed regions characterised by a well-developed infrastructural network, higher per capita incomes and strong links with the urban occupational structure tended to have a greater percentage distribution of high achieving schools.

Table 5.10 below shows the percentage distribution of primary schools by quality and by Province. There is a clear and positive association between regional development and the distribution of high quality schools. Thus Central Province, with a lower total number of primary schools than Nyanza Province (1158 compared with 1773 schools) has a much higher percentage distribution of 'high achieving' primary schools than Nyanza or Coast province (57% for Central Province, compared with 26% for Nyanza Province and 7% for Coast Province). The advantage of Central Province, and therefore of

Table 5.10: Percentage Distribution of Primary Schools by Type of School and Province

Province-District	Type of School			Total
	High Achieving	Medium Achieving	Low Achieving	
Coast - Kilifi	7	66	27	100%
Nyanza -Kisumu	26	63	11	100%
Central-Kiambu	57	39	4	100%

Source: Schooling Survey, 1979-80

the Kikuyu tribe, does not only apply to the distribution of 'high achieving schools. For Table 5.10 also indicates that Central Province has the lowest proportion of 'low achieving' schools than the other Provinces being compared.

The concentration of high achieving schools in Central Province is not coincidental. For as Table 5.11 suggests, higher achieving schools are associated with more highly experienced teachers, highly trained teachers and with higher per-pupil development expenditures. Both of these inputs - teachers and development expenditures - come from different budgets. Development expenditures come from community contributions, whereas teachers' remuneration is paid by local government. The higher total per-pupil expenditures associated with higher quality schools therefore reflect both community ability to pay the sums involved in establishing such schools, and its initiative, voice, power and effectiveness in mobilising public *and* private funds to improving the quality of its schools.

Why then are some communities more able and willing to make the sacrifices required to acquire high achieving schools? Inspection of the data suggested that this was likely to be the result of the socioeconomic characteristics of the students themselves. Table 5.11 also suggests that the parents of pupils who go to 'high achieving' schools have more education, a higher occupational status (and therefore wage income) and greater sized land-holdings than the parents of children in the other types of schools. The conclusion must be that the associations we find between school quality and socioeconomic background are not accidental; they arise because economic status - itself a by-product of educational status - determines the quality of learning environment in the home and, more importantly, the quantity and quality of schooling demanded, financed and obtained by members of one generation for the economic well-being of the next.

Table 5.11: School Environment Characteristics and Socioeconomic characteristics by Quality of School

Schools	Mean CPE Score	Mean Teacher Salary	Mean teacher experience
High Quality	185.2	895.9 Sh p.m.	11.23 yrs
Medium Quality	165.2	939.9	7.88
Low Quality	143.7	852.7	10.28

Schools	Percentage trained teachers	Pupil teacher ratio	Average attendance rate
High Quality	85.0%	43.4	89.0%
Medium Quality	61.0%	46.5	92.0%
Low Quality	56.0%	50.9	89.4%

Schools	Per pupil development expenditures	Mean Student Family Size	Mean Birth order of pupil
High Quality	57.0 Sh p.a.	9.5	3.5
Medium Quality	41.6	9.0	3.4
Low Quality	44.5	7.8	3.4

Schools	Mean landsize hectares	Highest education completed in family	Mean schooling of mother of student
High Quality	8.5	11.0 years	3.4 years
Medium Quality	5.7	10.1 years	2.6 years
Low Quality	4.3	9.7 years	1.7 years

Schools	Mean schooling of father	Mean father's occupational status*
High Quality	5.7 years	6.6 points
Medium Quality	4.4 years	5.5 points
Low Quality	3.6 years	3.9 points

* For derivation of point-score see Table 6.1, Chapter 6.

Source: Schooling Survey, 1980

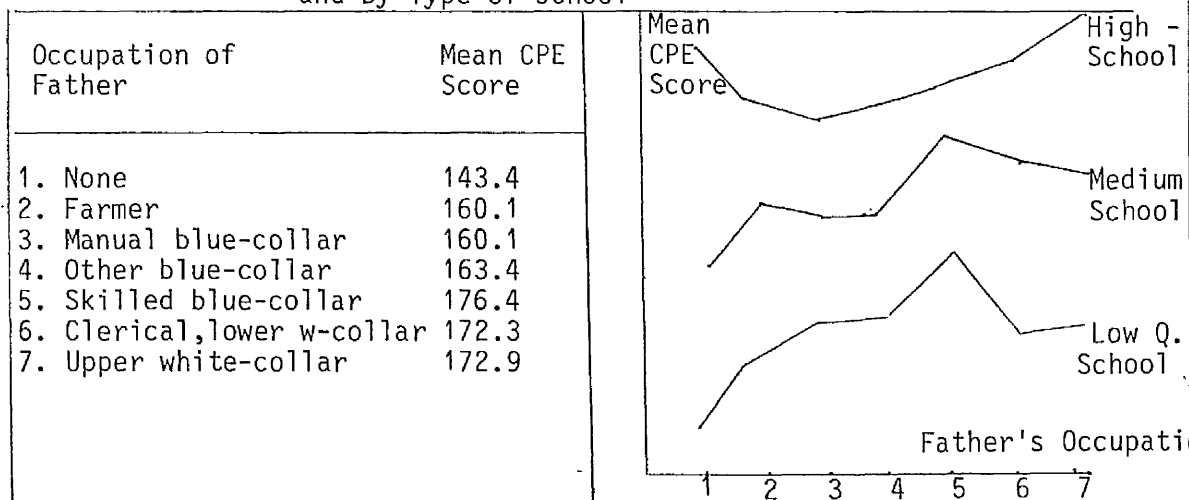
Thus, comparing children whose fathers ranked in the top fifth of the occupational hierarchy with those whose fathers ranked in the bottom fifth, test scores differed by an average of 29.5 points, even after controlling for school quality. Ranking children according to parental education, the disparity between top and bottom fifth was 32.6 points for father's education and 9.2 points for mother's education.

It was possible to conclude that a community which contained a greater proportion of its parents within the higher occupational strata and educational levels tended to improve the mean scholastic performance of its children, independently of the quality of the school they went to. It might be that this effect occurred either because of the higher quality of learning environment in the home, or because of the higher motivation for children of higher socioeconomic backgrounds to succeed.

Separating the sample by school quality, however, although a positive influence of higher occupational status on learning was seen to exist, it was found that this effect was overshadowed by the strong positive effects of school quality on learning. Children who went to 'high-achieving' schools were higher achievers than their peers from the same occupational and educational origins as themselves. And, of course, those children from low socioeconomic origins who were fortunate enough to live within the catchment area of a 'high achieving' school, acquired similar learning benefits by association with their more advantaged peers. Thus, although the 'high achieving' schools owed their existence to the pressures of the high-socioeconomic strata within the catchment area, the whole community stood to benefit in

terms of scholastic achievement, and hence in terms of later educational attainment and income.

Table 5.12: Mean CPE score of a child, by parental occupation and by Type of school



Source: Schooling Survey 1979-80

The foregoing analysis has important consequences for both disadvantaged and advantaged areas. In the former instance, where the relative scarcity of primary schools is greater and the socioeconomic backgrounds of pupils are lower, it indicates that the economic future of children who wish to enter primary schools is at risk: not only do they have fewer schools from which to choose to enter, but the majority of the schools to which they have access are of low-achieving status, which implicitly impedes their progress to secondary schools and the urban employment structure. Deprived of both equal access to schooling and to higher quality schools, they are likely to make smaller cumulative investments in education than their peers from more highly developed areas, even if they come from the same socioeconomic origins. In deprived areas, children born into poor homes do not acquire the skills they need from their parents, nor are they taught these skills in schools.⁷ And children of families who have

7. We are assuming that the examinations measure the skills required.

escaped from poverty are likely to fall back into it because of their low scholastic achievement. Thus, education, commonly adjudged to be a path to upward mobility for all, becomes a less effective route to occupational success for some, because economic factors determine both quality and access of schools.

Table 5.13 below, constructed from Schooling Sample data, provides strong evidence of the disadvantaged position of children from low socioeconomic backgrounds. When we compare children at school at three educational levels - primary, secondary and high school - we find that there is a greater distribution of students from higher socioeconomic backgrounds in the higher level of education. Thus 36% of EAACE candidates are from highly educated backgrounds compared with 30% of EACE ('O' Level) candidates and 29% of CPE candidates. It is difficult to say to what extent the selectivity of pupils in higher education represents a denial of equal opportunity and to what extent it results from variations in peoples' appetite for education. Since both secondary and higher education involve payment of fees, a certain amount of selectivity must occur because of the greater ability of higher income parents to pay for the further education of their children. But since entrance into secondary and high school is made on the basis of examination performance at the previous educational level, access to higher educational services becomes available only to a minority selected on the basis of academic performance - which we have shown to be correlated with economic status. Indeed, the positive correlation of academic performance and economic status allows us to conclude that different socioeconomic groups get unequal shares of the nation's educational resources. In other words, children from

rich families are likely to have higher educational achievements and stay in school longer than children from poor families because their parents can finance their education to the standard desired.

Table 5.13: Proportions of pupils in Primary, Secondary and High School, by Educational Level of Father

Father's Education(yrs)	Level of Education		
	Primary (CPE candidates)	Secondary (EACE candidates)	High School (EAACE candidates)
None	% 38	% 29	% 30
1-7 yrs	33	41	34
Over 8 yrs	29	30	36
TOTAL	100%	100%	100%

Source: Schooling Survey, 1979-80

Table 5.14: Form I enrollment as a percentage of previous year's Standard 7 enrollment by District

Province - District	Year	
	1974	1977
Coast- Kilifi	25 %	26 %
Central - Kiambu	41 %	51 %
Nyanza - Kisumu	24 %	33 %

Source: Educational Trends, 1973-1977. Ministry of Economic Planning and Development. CBS.

Table 5.15: Secondary School Enrollment Ratios. Age Group 13-16

Province- District	Year	
	1974	1977
Coast - Kilifi	0.03	0.03
Central - Kiambu	0.16	0.23
Nyanza- Kisumu	0.05	0.07

Source: Educational Trends, 1973-1977. Ministry of Economic Planning and Development, CBS

E. Conclusion

The overwhelming finding of this chapter is the strong and consistent limitation which regional development and ethnic origin places upon access and choice of schools. The process of assortment is effective in bringing about the systematic gradation of average achievement by region and therefore by tribe; within regions further assortment takes place by occupational origins and by schooling quality.

Our findings suggest that a large part is played by the association between the parents' ethnic origin, occupational-socioeconomic class and the capability developed by their children. It is not possible to identify the means by which parents impart skills to their children; it may be that children from the upper blue-collar and white-collar categories are let to develop the attitudes, interests and habits of mind which enable them to profit by education. They may have been made to feel that their parents want them to do well at school, and that ways of advancement in life are open to them if they do so. Certainly it is possible that a mixture of economic and cultural factors - limitation of means and amenities in low-income families, differences in outlook and aspirations, and lower recurrent and development expenditures in these areas reduce the average quality of the educational environment provided to their children.

What is crucial is the fact that differences in achievement by ethnic group and occupational class are reinforced by the qualitative differences in the provision of educational facilities to these groups. Not only do the more developed regions and higher-income families provide their children with greater total access to schools, but

they give them superior access to 'high achieving' schools - which schools have more experienced teachers, have smaller class sizes and lower teacher-pupil ratios. Children from higher socioeconomic backgrounds are therefore more likely to achieve superior school performance and consequently their parents make higher cumulative investments in their education, thereby providing themselves with a higher family income in the future.

The extent to which higher scholastic achievement is obtained by children from lower socioeconomic origins and ethnic groups is of great social significance in Kenya. Society appears to be moving towards one of entrenched privilege if few people from the low-income status can rely on moving out of it. And our findings suggest that children from lower occupational origins in less developed regions, when compared to their peers in other areas, are less likely - because of their lower probabilities of scholastic achievement - to move upward from the occupational and income class into which they were born. The process is self-perpetuating. Just as they are constrained by their environment, their own offspring will be so constrained. Because ethnic origin is so highly correlated with geographical area, this means that the gap between communities will widen over time unless those communities in deprived areas are able to further sacrifice current consumption in favour of educational investment.

Education, commonly regarded as a form of self-investment which equalises opportunities for all, therefore yields varying private rates of return to different groups partly because of unequal scholastic yields between communities.

CHAPTER SIX

INTERGENERATIONAL TRANSMISSION OF INEQUALITY

A. Introduction

A full analysis of the effects of education on the distribution of income should include inequality in income distribution between different generations of the same family - what is usually called in the literature, intergenerational 'occupational' mobility. This area has, until recently been primarily the concern of sociologists. A few years ago, however, economic status and the reproduction of income inequality in succeeding generations re-entered the economist's line of vision. In both substance and emphasis the economic theory of inequality and intergenerational mobility has expressed an important transformation of conservative theories by viewing income inequality as a result of behaviour (human capital investment) as well as hereditary factors and market luck, transmitted from one generation to another by their interaction. Hence, in Becker, we have people being poor because of the sins of their fathers rather than by their own choice.¹

The economic approach to the intergenerational transmission of inequality, views the individual as part of an infinitely long-lived family which has mortal representatives in each generation. The central decision-makers are parents, or heads of households, - in the wider kinship groups they would be clan chiefs - who can

1. Becker G.S., and Tomes N., "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility", Journal of Political Economy, 1979, vol.87.no.6

increase current consumption of the family at the expense of future generations, but are discouraged from doing so by their concern for the interests of their children and perhaps other future family members.

Present and future generations are fully connected by a series of intergenerational transfers, called 'bequests' from parents to children, and these include financial, human and social capital - the latter endowment taking the form of the family's religion, caste, 'race' reputation, connections and kinship network of contacts.

The theory also recognises that endowments and market rewards depend on luck, so that incomes are partly determined by the interaction between luck and maximising behaviour. But they are also held to depend upon government fiscal and social policy, the rate and focus of economic growth, the "decision-makers'" foresight about the incidence of market 'disturbances', discrimination against minorities and the family's efficiency in utility maximisation. Considerable inequality among different families in the same generation is consistent with a highly stable ranking of a given family in different generations.

In the context of this theory, this chapter focusses upon the process of transmitting advantage from one generation to another. It attempts to show that the intergenerational effects of income distribution are important because inherited capital (financial, human and social) determines intergenerational inequality. The

argument is that an analysis of the influence extended by the family on the income of its children is fundamental to an understanding of the process of acquiring prestige and economic success.

The extent to which there is upward income mobility from below is clearly an issue important for Kenya. For it concerns the extent to which there is 'equal opportunity' for children whose parents' economic position is dissimilar. And the issue of mobility between generations is distinct from the issue of equality. For any degree of inequality, the society can be a relatively static one in which children always assume their parents' position, or a highly mobile society in which the income position of the child is unrelated to that of his parents. The degree of intergenerational mobility would be determined by the distribution of income and its effect on parents' propensity to invest in the human capital of their children, as well as on market, institutional and genetic factors.

Ideally, in an analysis of intergenerational transmission of inequality or an empirical study of wealth mobility, it would be desirable to have time-series income and education data on families, as well as data on family size and other characteristics. One could then trace the effect of financial, human and social capital endowments across generations and measure the extent to which apparent changes in the relative resources of parent and future generations tended to be offset by equal but opposite changes in bequests. For example, increased public investment in education might be matched by reduced private investment in education and

vice versa although perhaps differently for different families and kinship groups.

However, empirical evidence on income bequests and other transfers to children is seriously deficient in Kenya. And in the absence of intergenerational data on income, we are left to pursue our analysis of the intergenerational transmission of inequality by approximating income with occupation. The primary analysis therefore takes the form of examining the influence of parental occupation (father's income) on son's occupation, and the effects of education (human capital) and social capital (kinship group) on this process. The full analysis is separated into two chapters: This chapter is concerned with the effect of a child's social capital on his earned income. It therefore simply examines the extent to which a man's social origins (father's occupation) affect his own occupational movements. However, because social origins tend to affect the human capital invested in him - see equation (72) in Chapter 2 above - we control for some aspects of human capital investments in the next chapter. Although these analyses do not take into account the linearity or additivity of relationships, they provide a useful supplement to the work of the regression chapters by taking into account the peculiarity of income-occupational distributions.

B. Methodology

To begin with, a framework for analysis will be provided by establishing the characteristics and structure of relations among occupational groupings. To do this, the concept of occupational mobility is separated into its constituent elements: career origins and occupational destinations. Origins are classified in terms of father's occupation (as a proxy for father's income)

and occupational destinations are represented by the respondent's occupation in 1980. Classification of origins in these terms is in the tradition of previous surveys of occupational mobility, and expresses the assumption that movements between father's and son's occupational categories reveal the sequence of changes in income between parents and children. If the degree of social and financial inheritance were to be negligible, then the equilibrium mobility between the incomes of parents and children would equal β , the propensity to invest in education of children, social capital and market luck being constant. And if the propensity of parents to invest in children was also held constant, movements between parental income (or occupation) and children's incomes (or occupation) would approach a random distribution. But, of course, if the scale of human capital investment and social capital transmitted by families were permitted to adjust, actual income distributions might be skewed to the right, as talents, abilities, opportunities educational investment and income are expected to be positively correlated. To take an example, since families with higher rates of return on their investment in human capital tend to receive more education, the correlation coefficient between parental and children's occupation would be high, as long as the distribution of all the other parameters were the same.

Because we do not have intergenerational data on income, and cannot therefore directly assess income stability across generations, the question we ask in this chapter is: does the sequence of changes in occupation between parents and children approach a random distribution (i.e. is the degree of social inheritance negligible?)

The occupational structure is divided for the purposes of the analysis into twenty occupational categories; these categories and not the individuals which comprise them are the units of analysis and the relations between the categories are defined in terms of the flow of manpower between them through time. Each occupation is therefore characterised by the inflow of manpower from various origins and by the outflow or supply of sons to various destinations.

The basic structure described above is subsequently enlarged in the next chapter by investigating how a variety of other factors contribute to occupational achievement and mobility. In sum, the conventional mobility matrix represents the structure of occupational allocations to be explained and the analysis of the conditions that determine the observed allocations, attempt to furnish the desired explanation.

In presenting upward or downward movement from one occupation to another, we begin by ranking occupations in terms of two criteria: mean income and education for each occupation. The ranking is presented in Table 6.1 below, where the percentage increase in each criteria is indicated as one moves up the ranks.

The ranking we use differs only marginally from that used by the Kenya Department of Employment. For occupational origins (father's occupation) farm and rural origins are placed first, before ranking urban unskilled occupations, while the self-employed category falls in-between blue-collar and white-collar occupations. Because the sample was one of urban employees, unemployed persons, as well as

farm and rural occupational categories do not appear as occupational destinations. Nevertheless as these groups supplied disproportionate numbers of sons to a variety of occupations, they are listed as occupational origins.

Table 6.1: Ranking of Occupations by education and mean income, for employees in 1980

Occupation	Mean Income		Years of schooling	
	(KSh.)	% difference	Mean ed.	% difference
1. Casual	542.8		6.8	
2. Unskilled	627.7	15.6	5.3	23.1
3. Mason,carpenter	752.7	19.9	5.8	9.4
4. Driver	886.0	17.7	5.4	6.9
5. Plumber	804.6	-9.2	7.1	31.4
6. Electrician	1352.4	68.0	8.5	19.7
7. Mechanic	1270.8	6.1	7.1	-16.5
8. Machine operator	721.0	-43.4	6.2	-12.7
9. Foreman,superv.	1636.4	226.9	9.5	53.2
10. Self-employed	752.0	-54.1	6.5	-31.6
11. Other skilled	982.1	30.5	6.4	-1.6
12. Sales staff	1583.1	61.1	9.7	51.5
13. General clerk	1534.9	-3.1	10.2	5.1
14. Typist, secr.	2101.6	36.9	10.4	1.9
15. Mid-management	5965.9	283.8	11.7	11.3
16. High-management	9610.9	27.5	13.0	11.1
17. Architect	6472.3	-15.0	15.0	15.3
18. Para-medical	3000.0	-53.7	10.0	-44.4
19. Agronomy	4940.0	64.6	13.6	36.0
20. Accountant	7900.1	59.9	13.3	- 2.3

Source: Labour Force Survey, 1980.

Table 6.2 below presents the transitional matrix of intergenerational mobility. That is, it presents an index of affinity between the

movements from the occupations of the father to the son's occupation in 1980. The percentages in the Table, computed horizontally, reveal the outflow from occupational origins to occupational destinations. The 'total' row at the bottom of the table indicates the percent of employees in the sample occupying the different occupational destinations and it is evident that the 1980 destination categories were not equal in size. They ranged from 27% of employees going into unskilled occupations, compared with about 1% of labour going into professional white-collar occupations.

And if one looks at the table as a whole, there is no clear trend of self-recruitment. The percentages are not highest in the major diagonal and this suggests that sons do not tend to remain in the occupations of their fathers. But, of course, the pattern is by no means consistent. That there is some degree of occupational inheritance is given by the fact that sons of upper white-collar occupations (categories 15 - 20) stand a good chance of becoming white-collar workers themselves. There is, in short, a suggestion of occupational (and therefore income) stability in the upper strata of society.

It is difficult, however, to measure the extent of occupational inheritance from Table 6.2 because although percentages in each column can be compared, meaningful comparisons are not permitted across columns. Thus, sons of all origins may seem more likely to move to unskilled or clerical occupations than to professional occupations, but this may be in part due to the fact that there are more people within these occupations than within any other.

TABLE 6.2 MOBILITY FROM FATHER'S OCC. TO RESPONDENT'S 1960 OCC. : OUTFLOW PERCENTAGES

Father's Occupation	Respondent's Occupation in 1960																				24th Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Farmer	2	33	5	6	4	1	8	12	6	1	2	2	15	2	3	1	.	.	1	1	100.0
Rural	1	32	3	.	2	3	8	14	5	3	1	22	3	2	1	.	.	.	.	.	100.0
1. Casual labour	6	36	.	15	5	.	.	11	3	.	3	.	15	6	.	.	.	.	.	.	100.0
2. Unskilled labour	1	28	5	2	4	2	5	15	9	.	.	1	18	6	1	.	.	.	1	.	100.0
3. Mason, Carpenter	.	23	6	.	4	.	15	4	13	.	.	.	29	.	6	.	.	.	.	.	100.0
4. Driver	3	13	8	4	9	.	13	13	6	.	2	2	19	2	2	2	2	.	.	.	100.0
5. Plumber	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	100.0
6. Electrician	.	.	25	.	.	.	.	25	.	.	.	25	.	.	.	.	.	25	.	.	100.0
7. Mechanic	6	12	.	.	.	.	12	24	6	.	.	6	29	.	5	.	.	.	.	.	100.0
8. Machine operator	.	.	.	.	25	.	.	50	.	.	.	.	25	.	.	.	.	.	.	.	100.0
9. Foreman, Supervisor	3	13	3	3	3	.	9	13	3	.	.	3	26	6	6	3	.	.	.	3	100.0
10. Self-employed	2	20	.	3	2	2	10	3	6	.	2	3	25	13	5	3	.	2	.	.	100.0
11. Other skilled	.	.	17	.	.	.	.	.	17	.	.	17	17	17	15	.	.	.	.	.	100.0
12. Sales-staff	.	33	.	.	.	.	.	.	.	.	.	.	64	.	.	.	.	.	.	.	100.0
13. General clerk	.	9	2	2	6	.	6	6	8	.	2	4	29	12	9	2	.	.	.	2	100.0
14. Typist, secretary	.	25	.	.	.	.	.	.	.	.	.	.	75	.	.	.	.	.	.	.	100.0
15. Mid-management	.	.	.	.	.	.	.	.	.	.	.	.	.	25	75	.	.	.	.	.	100.0
16. High-management	.	33	.	.	.	.	.	.	.	.	.	.	.	34	.	33	.	.	.	.	100.0
17. Architect	.	.	.	.	.	.	.	.	.	.	.	.	50	50	.	.	.	.	.	.	100.0
18. Para-medical	.	34	.	.	.	.	16	.	.	.	.	.	.	.	50	.	.	.	.	.	100.0
19. Agronomy	.	.	.	.	.	.	.	.	.	.	.	.	34	.	33	33	.	.	.	.	100.0
20. Statistician	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	100.0
Total*	2	27	4	4	4	1	8	11	7	-	1	4	18	5	4	1	-	-	-	-	100.0

* - in total row indicates percentages obtained are negligible.
 (N) denotes the number of respondents deriving from each category

The influence of occupational origins on occupational destinations and the deviation from random distributions of occupation are perhaps more meaningfully expressed by relative (not absolute) affinity between categories: specifically by deriving the ratio of observed to expected frequency of mobility by occupation.² This ratio, which in previous studies has been termed the 'social distance mobility ratio' measures the extent to which movement from one occupation to another falls short or exceeds 'chance' mobility. In the case of perfect mobility, each destination group would have the same distribution of origins as the total population, each origin group would have the same distribution of destinations as the total population; all indices would be 1.0. Therefore, a positive affinity, or some degree of stability (or inheritance) between the income of parents and that of children would be marked by an index greater than 1.0; in the opposite case, if the index is less than 1.0 then there would be some resistance to movement along that path. The actual mobility ratios in the Labour Force Sample for Kenya are given in Table 6.3. All values greater than 1.0 are boxed for visual effect.

C. Findings

The two tables bring the main characteristics of the Kenyan occupational structure into relief and there are two distinct patterns worth noting. The first pattern concerns mobility: whereas there is some degree of self-recruitment (entries along the main diagonal tend to be boxed entries), this tendency is eclipsed by the overwhelming tendency to move upwards from the father's occupational

2. By dividing each value in the Table 6.2 matrix by its counterpart in the total row at the bottom of its column, an index of the affinity between occupational origins and occupational destinations is obtained for Table 6.3. For previous use of this index, see David V. Glass (Ed.) Social Mobility in Britain, Glencoe: Free Press, 1956.

TABLE 6.3 MOBILITY FROM FATHER'S OCCUPATION TO RESPONDENT'S OCCUPATION IN 1980, ALL RESPONDENTS: RATIOS OF OBSERVED FREQUENCIES TO FREQUENCIES EXPECTED ON THE ASSUMPTION OF INDEPENDENCE

Father's Occupation	Respondent's Occupation in 1980																Σ
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Farmer	1.0	1.2	1.2	1.5	1.0	1.0	1.0	1.1	0.9	1.0	2.0	0.5	0.8	0.4	0.8	0.4	553
Rural	0.5	1.2	0.8	.	0.5	3.0	1.0	1.3	0.7	3.0	1.0	5.5	0.2	0.4	0.3	.	117
1. Casual labour	3.0	1.3	.	3.8	1.3	.	.	1.0	0.4	.	3.0	.	0.8	1.2	.	.	34
2. Unskilled labour	0.5	1.0	1.3	0.5	1.0	2.0	0.6	1.4	1.3	.	.	0.3	1.0	1.2	0.3	1.0	137
3. Mason, carpenter	.	0.8	1.5	.	1.0	.	1.9	0.4	1.9	.	.	.	1.6	.	1.5	.	47
4. Driver	1.5	0.5	2.0	1.0	1.8	.	1.6	1.2	0.9	.	2.0	0.5	1.0	0.4	0.5	4.0	53
5. Plumber	.	.	.	.	.	.	.	.	.	.	.	.	5.5	.	.	.	1
6. Electrician	.	.	6.3	.	.	.	.	2.3	.	.	.	6.3	.	.	.	25.0	4
7. Mechanic	3.0	0.4	.	.	.	.	1.5	2.2	0.9	.	.	1.5	1.6	.	.	5.0	17
8. Machine operator	.	.	.	.	6.3	.	.	4.5	.	.	.	.	1.4	.	.	.	14
9. Foremen, supervisors	1.5	0.5	0.8	0.8	0.8	.	1.1	1.2	0.4	.	.	0.8	1.4	1.2	1.5	9.0	32
10. Self-employed	1.0	0.7	.	0.8	0.5	2.0	1.3	0.3	0.9	.	2.0	0.8	1.4	2.6	1.3	5.0	119
11. Other skilled	.	.	4.3	.	.	.	.	.	2.4	.	.	4.3	0.9	3.4	3.8	.	7
12. Sales staff	.	1.2	.	.	.	.	.	.	.	.	.	.	3.6	.	.	.	3
13. General clerk	.	0.3	0.5	0.5	1.5	.	0.8	0.5	1.1	.	2.0	1.0	1.6	2.4	2.3	4.0	53
14. Typist, secretarial	.	0.9	.	.	.	.	.	.	.	.	.	.	4.2	.	.	.	4
15. Mid-management	.	.	.	.	.	.	.	.	.	.	.	.	.	5.0	19.0	.	4
16+ Professional occupations	.	0.4	1.0	.	.	1.0	0.4	1.4	.	.	4.0	1.4	3.8	2.5	3.0	.	15
																	100.0

Source: Labour Force Survey, 1980

base. The second pattern concerns recruitment into the wage structure: more than half the number of wage employees in 1980 were the sons of other wage employees, and this pattern reflects a distinct barrier to upward movement for the sons of farmers.

With regard to the pattern concerning mobility, we look first at the diagonal of cells in Table 6.3 (sons of masons, moving into masonry occupations, and so on) which shows the extent to which entrants into a given stratum of occupations (or income) come from the sons of fathers in that stratum. We then look at the prevailing direction of movement, as given by the number of cells and by the relative proportions of boxed entries on either side of the diagonal.

That there are many boxed entries in the major diagonal reflects a tendency for remaining in the father's occupation. There is, in short, some tendency to self-recruitment. However, dominating the intergenerational pattern of labour mobility is an excessive tendency of sons to move upward from their occupational origins. A rough guide to the disproportionate amount of upward mobility is given by the fact that boxed entries to the right of the diagonal outnumber those on the left by more than two to one (52:23). In percentage terms, only 5.6% of all sons stayed within their father's occupational category, whereas 74% moved upwards from it.

As one would expect, this upward spread to other destinations is particularly marked in the six lowest categories: farming, rural

employment, casual and unskilled employment, masonry and carpentry, and driving - although it exists to some extent in every category. This upward spread from the six lowest categories is expected given the fact that the occupational pyramid tends to be widest at its base and therefore would tend to produce the greatest absolute number of sons moving upwards from that base. Long distance movements from father's occupation occur with a high degree of frequency: there is no concentration of boxed entries adjacent to the major diagonal. Rather the boxed entries appear to be spread away from the diagonal. Thus although 2.2% of sons moved only two occupational categories upwards from the father's occupation, 72% moved three or more categories higher.

We turn now to the matter of recruitment: Whether the volume of outflow or inflow is highly dispersed or highly concentrated is a question which is particularly important for Kenya in terms of its effect upon the recruitment and potential income of labour. The outflow from a given occupational origin may disperse to supply many different destinations, or become concentrated to supply only a few. The importance of either pattern lies in the fact that the distributing occupations become channels for upward mobility into which successful sons of lower income strata can enter, and from which successful sons can move out into even higher income strata. And as long as these channels are open, there will be no barriers to upward income attainment (or occupational movement) for the competent sons of lower origins. However, if some proprietorship over the recruitment channels exists from within

the occupational structure, there will be restriction of upward movement from the lower regions; over time the recruitment distribution will depart further and further from the random expectations based on the whole population. In short, proprietorship in occupational categories skews the distribution of income between generations.

It is evident from table 6.2 that the four occupations characterised by a high rate of inflow of manpower from different origins and a high rate of outflow of manpower supplied to other destinations are the two lowest groups in the occupational hierarchy - farmers, and rural workers - as well as the two categories at the upper reaches of the blue-collar category - self-employed workers and foremen. Sons of these workers have tended to disperse widely in their careers, supplying labour to a variety of occupations, whereas sons of other groups, especially white-collar strata have become concentrated in relatively few occupations.

Of these supplying occupations, the farm group stands apart, because although the extent to which farm sons have penetrated wage occupations is considerable (44%), it falls short of one's expectations based on the assumption of statistical independence. In 1980, the farm category was still the largest of the 24 occupational groups, accounting for over 80% of the working labour force. With no barriers to entry into wage (non-farm) employment in the urban sector, and the higher fertility of farmers, one would expect a high recruitment of farm sons - unless of course, the wage occupational structure were to rest upon a heavy degree of proprietorship.

The degree of proprietorship can be measured by dividing the sample into two broad classes: farm and non-farm (blue-collar and white-collar) labour. It is evident from the last column of Table 6.2 that only 44% of all recruitment in 1980 came from farm origins, whereas 56% came from non-farm origins. In other words, more than half of all wage employees in 1980 were the sons of other wage employees. An alternative way of looking at this would be to say that there was a much lower recruitment of sons from farm origins than one would expect on the basis of chance.

This restriction on the upward mobility of farm sons, reflects one of the two boundaries existing within the Kenyan occupational structure: a barrier to entry of labour from farm origins. Simultaneously, of course, it evidences the tendency of the urban wage occupational structure to recruit members from within its own ranks.

There is, however, one other boundary which adds its weight to the effect of restrictions upon the volume of manpower flowing upwards: it is a boundary that exists between white-collar occupations and all lower occupations, and serves to prevent sons of lower income strata from rising to white-collar status, while simultaneously permitting sons of higher income strata (i.e. sons of white-collar and professional parents) to remain in the generally privileged income strata into which they were born.

Limiting our attention to the last five rows of Table 6.2 and 6.3 which represent the outflow of manpower from white-collar origins to all other destinations, it is possible to note the remarkable

resistance to movement downwards from white-collar origins, and the strong impetus to stay within white-collar occupational categories. In Table 6.3, cells to the left of column 11 in these last five rows are either empty or have an index of affinity lower than 1.0, while most of the entries on the right of column 11 are much greater than 1.0. In sum, more than two-thirds of wage employees in the white-collar category were the sons of other white-collar workers, a condition which reflects the increasing ability of the white-collar category to maintain its elite position in the occupational hierarchy, with predictable consequences for future employment and the distribution of income.

The hypothesis we present for this phenomena is that occupational solidarity within the white-collar group prevents the dispersal of the sons of white-collar workers into a variety of different occupations. The corollary (which can only be verified by time-series data) is, of course, that the more thoroughly the men entering an occupation are integrated into it, the less likely they are to disperse to other occupational groups.

Higher white-collar occupations in general require the rarest skills, command the highest salaries and exercise the greatest authority. There is, moreover, a 'halo' effect from upper white-collar jobs which reflects onto jobs lower down in the white-collar hierarchy - jobs that require less skill and command less remuneration, but are much sought after for their white-collar status. It is because of the inherent prestige attached to these white-collar jobs that, regardless of their

skill component or remuneration, the sons of most workers will set their sights upon such jobs, in preference to some better-paid blue-collar jobs.

However, the competitive edge cut by sons of white-collar workers in terms of their higher resources, training and education (which criteria are intimately involved in the process of job selection at the white-collar level) as well as their prior and more precise knowledge about careers and job vacancies in the labour market in Kenya - a market which does not advertise but recruits by personal contact and recommendation - allows this group to consolidate their position at the top of the occupational hierarchy. They appear to have created an effective boundary between themselves and others which acts to produce a sharp break in downward mobility from white-collar occupations and restricts upward mobility from other lower occupations.

As long as recruitment into white-collar occupations is characterised by a considerable degree of inheritance (sons moving exactly into or above the occupational and income categories of their fathers) the implication is that long-run income inequality is widening as the sons of richer families are highly stable in their incomes while the sons of poorer families are highly unstable in their earnings.

The direction and extent of upward mobility from lower origins as well as the degree of downward mobility from higher origins is, of course, crucial to an understanding of the extent to which

career chances are limited and conditioned by income origins. It also begs the question of the extent to which, over time, continuation of these trends has allowed the recruitment distribution to depart from random distributions based upon the entire population.

(1) Historical Trends

What evidence we have for the course of occupational mobility and therefore income inequality over time, at least so far as it extends, reinforces any expectation we might have that upward intergenerational mobility has decreased with a widening of the labour market and an extension of education. But the general trend of downward mobility has not been extended to the white-collar occupational categories which have reinforced their position over time. Indeed, the analysis suggests that the existence and increase of occupational solidarity in the upper income strata, combined with the differences in economic conditions, styles of life and value orientations generated by the wage structure have revealed a gradient which has become particularly pronounced for those far apart in the occupational hierarchy.

It is possible to hypothesise that as employment conditions in wage occupations widened their appeal, men were inordinately drawn to them from diverse origins. But the consequent greater competition for these desirable jobs made it more difficult than it was previously for men from distant origins to move into such occupations. Over time, increasing inheritance of status encouraged the sons of men who entered careers in a certain line of work to remain in it, while ensuring that their upward movement from one stratum opened up opportunities for their sons in another.

It is possible to assess changes in mobility over time by separating the sample of respondents into two artificial cohorts: those sons who began their employment prior to and during 1968, and those sons who entered the labour market between 1969 and 1980. A matrix of occupational mobility (comparable with Table 6.3) can be separately constructed for each of the two groups of sons. These are presented in Tables 6.4 and 6.5.

The evidence in these tables allows one to confirm that the effect of the two boundaries has been reinforced over time. From the last columns of Tables 6.4 and 6.5 it is apparent, for example, that the proportion of farm and rural sons entering urban occupations has diminished. Recruitment from both farm and rural origins decreased by 17% during the period - from 63% prior to 1969 to 46% thereafter. Indeed there was a one-fifth reduction in the recruitment of farm sons alone - from 55% prior to 1969 to 35% thereafter.³

The barriers to upward mobility for sons of farm origins might have been overcome by the greater educational attainments of the later entering cohort, allowing the dispersion of farm sons to be less concentrated in blue-collar destinations than they were before. Prior to 1969, 78% of farm sons entering urban occupations obtained manual or blue-collar jobs; the corresponding proportion for the later cohort was slightly less: 72%. Needless to say, the reduction in movement from farm to blue-collar occupations was matched by a corresponding rise in the number of farm sons directly obtaining white-collar jobs. Perhaps this was caused by the general expansion in educational attainments of the labour force.

3. And the proportion of farm sons in the economy was actually rising during this period at a rate of approximately 3.9% per annum.

The upper boundary in the labour market was similarly sustained during the period. Whereas only half (50.5%) of the early cohort of white-collar sons obtained white-collar occupations themselves, 60% of the later cohort inherited the white-collar occupational classification of their fathers. This strengthening of position can partly be attributed to their greater educational attainments- but it is also partly due to the fact that in volume terms they were able to consolidate their position in all other occupational categories as well. Whereas prior to 1969, 15.3% of all entrants into urban occupations were from white-collar origins, by 1980 this proportion had risen to 23%. In Becker's terminology, heads of families in white-collar occupations may have had greater foresight about the incidence of market 'disturbances' and may have committed their human capital investments in their children so as to profit from these fluctuations.

The strengthening of the two boundaries within the occupational structure together had a dampening effect upon the volume of upward mobility during the period under review. Of the older generation of labour entrants, 84% had entered occupations higher than their fathers, 16% found employment in equivalent or lower occupations. Between 1969-1980, however, 75% of men entered occupations higher than their fathers, and there was more movement (25%) in the direction of non-competitive groups and downward. Hence a labour entrant before 1969 was 2.5 times more likely to move upward than downward, but only 1.4 times as likely to move upward than downward thereafter.

The trend of decreasing upward mobility and increasing downward mobility is further highlighted in the following tables which relate the origins of labour to their final destinations in three broad occupational groupings: manual, blue-collar and white-collar.

Table 6.6 (a) Recruitment to Manual Occupations

	Occupational Origins of Labour (Per Cent)					(N)
	Farm	Manual	Blue-Collar	White-Collar	Total %	
Before 1968	71.7	19.0	7.2	2.1	100%	(237)
1969-1980	53.5	29.4	11.1	6.0	100%	(269)

Source: Labour Force Survey, 1980

Table 6.6 (b) Recruitment to Blue-Collar Occupations

	Occupational Origins of Labour (Per Cent)					(N)
	Farm	Manual	Blue-Collar	White-Collar	Total %	
Before 1968	66.1	16.6	11.7	5.6	100%	(180)
1969-1980	52.9	22.9	14.8	9.4	100%	(170)

Source: Labour Force Survey, 1980

Table 6.6 (c) Recruitment to White-Collar Occupations

	Occupational Origins of Labour (Per Cent)					(N)
	Farm	Manual	Blue-Collar	White-Collar	Total %	
Before 1968	46.1	18.5	22.4	13.0	100%	(130)
1969-1980	35.1	20.7	22.7	20.3	100%	(246)

Source: Labour Force Survey, 1980

In volume terms, the tables indicate that the increase in recruitment was greatest in the direction of self-recruitment. Thus, the movement of labour from manual origins to manual destinations - Table 6.6 (a) - increased by 10.4% while that from white-collar origins to white-collar destinations - Table 6.6 (c) - increased by 7.3% during the same period. Of equal significance, however is the fact that recruitment of farm sons was the only category which decreased its hold over the urban wage labour market, and naturally, the reduction was most marked in manual occupations which was their springboard for movement into higher income occupations.

D. Conclusion

The extent to which occupational entry, income and status are accessible from below is of great social significance in Kenya. More than four-fifths of the population originate from rural areas and as long as income opportunities are on the increase, but only to sons of men who have already gained a foothold upon the labour market, the argument implicitly advanced is that the labour market might be moving towards one of entrenched privilege particularly if labour within the occupational structure, and especially those few people in the top grades are able to consolidate their position over time.

The general finding of this chapter is that higher income opportunities are rapidly being limited to the sons of fathers who are already part of the elite. From a relatively dynamic society in which

there was a great deal of upward income mobility, and the wage income of children was not always related to that of their parents, society is swiftly becoming a relatively static one in which children tend to assume their parents' income position. There is, in short, a high propensity of children to inherit the income category of their fathers, and indeed, to consolidate this position over time.

The relationship between social characteristics of parents (social capital bequests to children) and the income producing characteristics of their children is a relatively old one to both social scientists and policy makers. Our analysis of occupational mobility between generations therefore reflects the recognition that some children would arrive in the market handicapped by fewer accumulated investments in 'social' capital - in this instance, their social origins and the network of parental contact in the upper regions of the labour market.

The unanswered question is, however, whether human capital investments in children are positively linked to bequests of social capital, strengthening the link between the income categories of fathers and that of their sons. We have already noted the possible effect of the rising trend of education, in the capacity of some farm sons to find direct entry into the white-collar regions of the occupational structure, despite the high degree of occupational solidarity from its incumbents. There are at least two other factors which may have interacted to produce the patterns of mobility we have found: market luck and investments in human capital. We control for these parameters in the following chapter.

CHAPTER SEVEN

INTERGENERATIONAL TRANSMISSION OF INEQUALITY: EFFECT OF VARIATIONS
IN MARKET LUCK, HUMAN AND SOCIAL CAPITALA. Introduction

The purpose of this chapter is to examine the extent to which variations in human capital (educational investment), social capital (genetic inheritances of kinship origins and 'connections') and market luck have affected intergenerational transfers of income.

We have chosen to examine interactions between human and social capital and earnings mobility in this light for two reasons. Firstly, there has been some curiosity about what segments of the Kenyan population have experienced greater or lesser earnings achievements via occupational mobility and have been able to transmit their advantages to their children. Impressionistic observation of the Kenyan income structure has suggested that some groups suffer occupational and income disadvantages whereas others exhibit a clear tendency to obtain higher occupational as well as earnings status. Such observation has often led to the assumption that the observed differentials in mobility distributions and earnings distributions are the direct result of discrimination or the manipulation of some groups by others. This may not be the only cause of unequal earnings distributions. Differentials may be the result of differences in

orientations and abilities, or the result of initial chance associations among factors within groups which facilitated the greater upward movement of certain individuals or groups rather than others. Thus it may be that individuals from the Kikuyu tribe were initially advantaged in being closer to the metropolis and therefore were able to acquire positions in wage occupations earlier than other groups. In Becker's terminology, they may have been subject to unusually favourable market 'disturbances' or had a great deal of 'market luck' in one generation which permitted them to invest more in the human capital of their children, and increase their children's income so that succeeding generations would benefit from the initial bout of luck. Their own higher baseline position in terms of educational attainment, and their later higher investment in the education of their sons may have enhanced their rapid upward movement within the occupational structure. Naturally, differences in occupational achievement would be perpetuated because future generations of this ethnic group would be advantaged in being able to embark upon their careers from a higher income base than other ethnic groups. The process of upward movement so described would be the direct, natural and logical result of acquiring an early foothold upon the formal labour market, and strengthening this position by a high propensity to invest in the human capital of their children.

Secondly, although we do not have data on financial income bequests between parents and children, nor can we measure 'market luck' by some objective yardstick, we explore the interactions among factors in a manner which will allow us to reach interesting

and valid conclusions about the income mobility process in Kenya, supplementing the results of the regressions on earnings in the earlier chapter.

The hypothesis we present runs briefly as follows: If all families or all kinship groups were basically identical, incomes would be unequally distributed because of the unequal incidence of innate endowments among individuals and market luck. The income inequality in any generation depends not only on the inequality of luck in that generation, but also in a decisive way, on the luck in previous generations.¹ If 'lucky' parents invest more in the human capital of their children, the increase in their children's incomes would in turn induce them to invest more in their own children in the succeeding generation, and so on until all descendants benefit from the initial luck.²

We argue that the Kikuyu tribe in Kenya had considerably greater market luck than other ethnic groups, and this raised their equilibrium level of income and propensity to invest in the human capital of their children. Their early entry into the labour market raised their social capital because their families had an incentive to maintain and enhance their reputations by controlling and guiding the human capital characteristics of their members. Over time the effects of inherited market luck and higher human capital investments would allow their income distribution to be skewed to the right in comparison with the income distributions of other ethnic groups.

1. Becker, Gary S. and Tomes, N., "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility", Journal of Political Economy, 1979, vol.87, no.6 pp. 1160-1161.

2. Ibid., p.1161.

B. The Incidence of Market Luck: The Spread of the Labour Market

In the early 1900's in Kenya, the labour market spread outward from three nodes of development - Mombasa, the port; Nairobi, the administrative and settler centre; and Kisumu, the transport depot for Uganda. Recruitment efforts for labour turned naturally to the African sources of labour nearby.

By about 1915, approximately 50% of the able-bodied, adult male Kikuyu population in Kiambu District had entered employment at some time during the year, compared with about 36% of the Luo population in Central Kavirondo around Kisumu. The comparable figure for the Kamba tribe was only 8% and for the Luo of South Kavirondo, 11%. In Mombasa, only the population of ex-slaves and Moslem converts, mostly Swahili, with some Arab and African immigrants, formed the core of the port and town labour force. The Kikuyu therefore, formed by far the largest proportion of the wage labour force at a very early stage in the development of the wage labour market.

Differences in response to wage-earning opportunities were directed to some extent by geographical distribution of such opportunities, but they were also conditioned by the extent to which wage employment was seen by the various ethnic groups in Kenya as an economically profitable activity, compared with the alternative of marketing own-agricultural production. Thus the Coastal groups - Digo, Duroma, Giriama, some pastoral (Maasai) semi-pastoral (Kamba) and agricultural (Luo of South Kavirondo, Mijikenda) groups did not participate in the early wage economy despite their proximity to some employment centres. In contrast, the Kikuyu of Kiambu and Luo of Central Kavirondo were

migrating 'in their thousands' to the three centres mentioned, and to the highland plantations as squatters.³ Indeed, there was constant pressure upon the Kikuyu to supply more labour to highland farmers who were constantly in short supply of labour.

The advantages of early entry and early mastery of the skills needed for advancement were most clearly reflected among the Kikuyu of Kiambu. Their quickly acquired proficiency in ploughing, coffee-pulping, husking, pruning etc. meant that not only did unskilled labour for work in highland farms of Kiambu soon have to be procured from other districts, but harvesting rapidly became the province of Kikuyu women and children who were both skilled and cheap. By 1925, forty per cent of the Kiambu Kikuyu were in the wage workforce and about two per cent were attending school.⁴ At the end of the decade, these figures had reached approximately 75% and compared with 44% for the Luo in Nyanza Province.

In contrast to the Kikuyu, the Luo tended to specialise in full-time heavy and difficult jobs such as railway construction, work at the Mombasa docks, the Magadi soda works or sisal factories near the coast. Whereas the Luhya and Kikuyu went to farms as casual labourers in addition to providing some industrial work, the Luo were gradually ceasing to become agricultural labour, partly because of the persistence of their traditional landholding customs - according to which each son was entitled to a segment of the parental landholding - but also because the greater distance to the market centres of Nairobi and Mombasa both reduced the rates of return to agricultural

3. Stichter, S., *Migrant Labour in Kenya. Capitalism and the African Response 1895-1975*. Longmans Group Ltd. 1982. p.49. By July 1910 there were 11647 Kikuyu squatters in the nearly 50 estates in the Kiambu district and about 3000 Kikuyu were employed on farms directly for wages in addition to the steady stream of departures for Naivasha and Nakuru farms.

4. Ibid., p.51.

activity, and increased their reliance on the wage-labour market to supplement farming income. By the 1930's almost all Luo men had entered the labour market at one time or another in their lives and the contribution of wage earnings to incomes was very high; but they still specialised in manual work.

The Kikuyu, meanwhile could be divided into three categories:

- (1) those with large or above-average landholdings, able to develop their land and cease dependence on the wage labour market;
- (2) those with medium or small land holdings who used the labour market as a means of providing intermittent flows of cash to agriculture via migrant labour;
- (3) landless or very small land owners who became more or less permanent migrants to the growing urban centres.⁵

In addition, joint landholding structures prevalent among the Kikuyu were beginning to disintegrate in favour of individual family holdings.

Thus, among the first societies to move into wage labour - Kikuyu, Luhya and Luo of Central Kavirondo - wage earnings were rapid and yielded some rewards to the quickest adaptors while among the second group - Embu, Meru, Kamba, Gusii and Luo of South Kavirondo - entry into the wage labour force was less rapid and sometimes accompanied by protest. In the third group - Maasai and Mijikenda - involvement in the wage structure remained minimal.

In the two major labour supplying areas - Central and Nyanza Province - the different patterns of townward migration closely matched the ethnic structural differences in land-holding arrangements.

5. Ibid., p. 102

The Luo and Luhya, unhampered by the probabilities of losing their land rights at home, could maintain a continued and long-term supply of labour to areas of employment geographically distant from their home. While the Kikuyu, with psychological and physical commitments to their land-holdings, preferred to supply labour only to the metropolis, which was close to their homeland, and also permitted frequent visits to their land-holdings.

During the early 1950's, the migrant labour economy offered only a limited range of skilled occupations in agriculture, since mechanisation was not widespread. African entry into the commercial transport, communications and construction industry, although not legally barred, placed them at disadvantage in comparison with the Asian and European groups, in terms of education and training, racial discrimination and legalised differences in remuneration as evidenced by the racial 'grades' in the Civil Service. They were also disadvantaged in terms of their part-time position in the labour force and by their late entry into it compared with full-time more educated workers from other colonies such as India who had a longer history of labour force participation and were cheaper by European standards of remuneration.

The overlap between occupation and racial employment soon became significant. Businessmen, settler-farmers, top civil servants and professionals were Europeans; traders, middle-level civil servants, white-collar workers, some skilled manual workers were Asians; and Africans accounted for unskilled and semi-skilled positions at the bottom of the occupational structure.

In the late fifties and early sixties, three events combined to change this structure. Firstly, the evangelising zeal of missionaries contributed to the improvements in education and vocational training of Africans in mission schools - primarily in Central and Rift Valley Province, although to some extent in Western and Nyanza Province. And this led to the emergence of Kikuyu and Luo in the clerical strata of the Government services. Secondly, a solidification and expansion of the industrial base and the bias towards imported labour-saving techniques changed employment levels, skill demands and wage payments. Between 1947 and 1964 there was a steady shift away from unskilled labour to semi-skilled and skilled labour, and there were improvements in employment levels. Thirdly, the vigorous job-Africanisation policy following independence in 1963 made a large number of middle-level and white-collar jobs available to the most educated segments of the African labour-force, which were predominantly Kikuyu, although to a lesser extent, Luo. By now, the positive correlation between urban wage income and size of landholding was evidence of the fact that wage employees were investing some of their earned income in agriculture - by the direct purchase of rescheduled lands, and by improved inputs into agriculture.

The movement of the most educated Africans into middle and high level positions vacated by European and Asian labour inevitably resulted in long-term alterations in the criteria for selection into the occupational structure. As selection now became tied to educational achievements, entry into the occupational structure

increasingly reflected selective factors - higher income origins and superior investments in education. Any ethnic groups which were positively associated with these characteristics obtained a real competitive advantage over others.

B. Human Capital Investment, Migration and Intergenerational income Mobility.

In this section we deal with the effects of investment in human capital on physical mobility (the propensity of an individual to migrate) and on intergenerational mobility.

Since ethnic origin in Kenya is so closely associated with geographical area, the place in which a man is born (or the ethnic group he belongs to) affects his chances of wage employment directly, by increasing his chances of living in the area of birth as an adult, and indirectly, by subjecting him to the socioeconomic, ethnic and educational advantages of his birthplace. Psychological attachments and economic limitations might restrict motility, but migration for employment in Kenya has come to be associated with superior education and occupational/income achievement, regardless of the migrant's birthplace or destination. Thus, individuals who are in wage employment outside the area of their birth tend to have achieved higher education and earnings status than the community they left behind.

Evidence for this generalisation is presented in Table 7.1 below. Here, educational comparisons are made between all persons in Kenya

in 1969 and 1979, and migrant individuals selected from our Labour Force Sample, separated into two artificial cohorts: those who entered the wage market prior to 1969 and those who entered between 1969 and 1979. Because the migrant individuals in our sample had different demographic characteristics when compared with the total population, the census figures for 1969 and 1979 have been adjusted for sex and age.

Table 7.1: Education of Migrants and the general Population 1969 and 1979. (Percentages)

Educational Level achieved	Population	Migrants	Population	Migrants
	1969*	- 1969	1979*	1969-1979
	%	%	%	%
No school	72.9	26.7	58.7	3.1
1-7 years	22.9	43.0	26.5	29.6
8-10 years	3.9	28.0	13.2	21.0
11 years and over	0.3	12.3	1.6	46.3
TOTAL	100.0%	100.0%	100.0%	100.0%

Sources: Labour Force Survey, 1980.

Kenya Statistical Abstract, 1972 and 1981.

Note: Migrants were 94% of the urban labour force sample.

* Census figures have been adjusted for sex and age.

Figure 7.1 Distribution of Migrant Labour by Age in 1980.

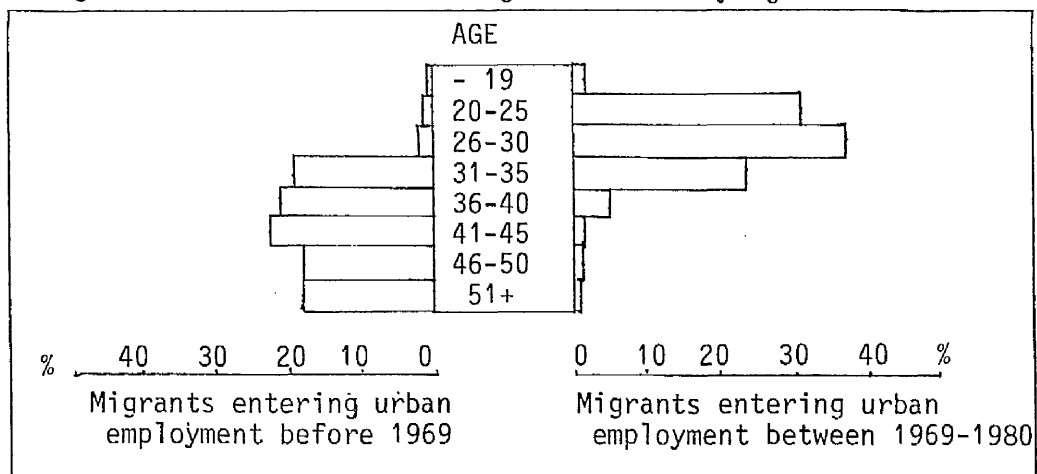


Table 7.1 unequivocally shows that migrants have higher educational attainments than persons still living in the region of their births and this selectivity of persons more highly qualified and therefore predisposed to occupational success was greater in 1979 than in the previous decade.

However, although migrants are better off than they would be if they remained at home, their educational superiority was found to depend upon the extent of their urbanisation. Stratification of migrants in the sample by origin, clarifies the differences in opportunity structure and achievement between the groups.

Table 7.2: Education and Occupation of Migrants by Origin

Origin of Migrants	Education Completed (years)					TOTAL%
	0	1-7	8-10	12-13	14+	
City origin	5.1	15.3	57.6	11.8	10.2	100.0%
Town origin	9.6	34.1	46.3	7.9	2.1	100.0%
Rural origin	9.9	37.1	45.2	6.2	1.6	100.0%

	Occupational Destination			TOTAL
	Unskilled	Blue -Collar	White-collar	
City origin	6.7	26.6	66.7	100.0%
Town origin	18.5	43.4	38.1	100.0%
Rural origin	34.2	35.7	30.1	100.0%

Source: Labour Force Survey. 1980

The Table above clearly shows that there is a positive correlation between the degree of urbanisation, and the education and occupation of the migrant. The more urbanised the environment of origin, the higher the mean educational achievement and occupational destination of the migrant.

The clear implication is that the socioeconomic structure of the community where an individual grew up serves as an ascriptive determinant of his later success. The positive association between urbanisation of place of origin and education achieved also however, means that migrants from towns or rural areas to cities are at a competitive disadvantage when compared to native born residents of the city. They may have acquired superior education to the community they left behind but their achievements are inferior to those of native-born residents within a city, and also of migrants from more urbanised origins than themselves. And their education disadvantages are translated into wide differences in occupational achievements and the period of time spent looking for a job. Table 7.3 below makes a comparison of education, occupation and duration of unemployment for migrants from rural areas and native city-borns - or those individuals within commuting distance from the city. In the case of our sample, these included migrants born within a 50 mile radius of the city.

Table 7.3 Education, Occupation and Unemployed status of rural migrants and city-borns.

	Education completed (years)			TOTAL
	0-7	8-11	12+	
Rural migrants	46.0	46.0	8.0	100.0%
City-borns	20.3	56.0	23.7	100.0%

	Occupational destination			TOTAL
	Unskilled	Blue-collar	White-collar	
Rural migrants	29.0	38.8	32.2	100.0%
City-borns	6.7	27.1	66.2	100.0%

	Period of time actively spent unemployed and looking for work (years)					TOTAL
	0-1	1-4	5-8	9-15	16+	
Rural migrants	54.3	32.2	9.0	3.5	1.0	100%
City-borns	71.1	23.7	5.0	-	-	100.0%

Source: Labour Force Survey, 1980

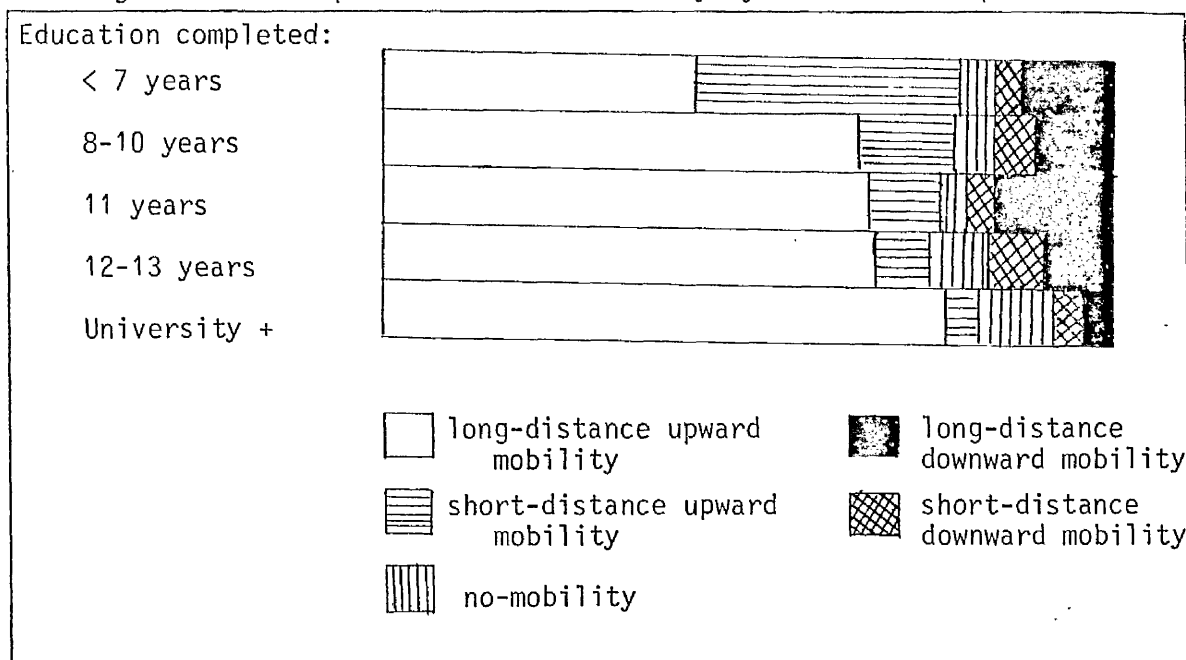
The disadvantages of rural migrants in terms of educational attainments and occupational destinations are, of course, self-evident. But it is with regard to duration of unemployment that the differences are most pronounced. Almost three-quarters of city-borns spent less than one year looking for jobs compared with approximately half of the migrant group who spent more than one year looking for a job.

The importance of the type of community in which a person has been brought up for his educational and occupational status can only mean that more urbanised family environments are better able to prepare individuals for occupations of higher status. Preparation may partly involve a more intimate knowledge of urban employment conditions, job selection factors and sensitivity to changes in market conditions for labour. Permanent residence within a city or proximity to a city tends to extend and stabilise a network of kinship contact providing information and support for applicants searching for jobs. But the most important form of preparation for higher income occupations is undoubtedly the higher propensity of urban families to invest in the education of their offspring. Superior education not only improves the probability of obtaining employment, but it is directly associated with upward mobility in the occupational structure.

The relevance of education in achieving occupational status can be seen from Figure 7.2 below which presents the degree of upward and downward mobility associated with different levels of

completed education. It is striking that the proportion of individuals who have moved upwards a long distance from their

Figure 7.2: Occupational-income mobility by education completed



Source: Labour Force Survey. 1980

income origins increases in a regular fashion with completed education, from 42% for those with the least educational attainments (<7 years) to 77% for those with some University training. What is particularly interesting is the fact that for the lowest educated category, upward movements are evenly divided between short and long distance movements from income origins, whereas for the most educated category, upward movements consist almost entirely of long-distance movements from origins. Hence for those individuals with primary school education or less, the ratio between short and long-distance movements upwards is 1: 1.2 whereas individuals with some University education are twenty times more likely to experience long-distance than short-distance movements upwards from their income origins.

Of course, the interactions between investment in human capital and intergenerational mobility can be expressed in a different way. One can say that the higher is the education achieved by an individual, the more certain are his chances of entering higher income occupations. But there is another correlation which must be expressed: the richer the family origins of an individual, the greater the human capital investments transferred to him by his parents. Thus of those individuals in the Labour force sample with primary education or less, 97% came from manual or blue-collar backgrounds and 92% went into manual or blue-collar occupations themselves. Of those individuals with secondary education, a lower percentage (86%) came from manual or blue-collar backgrounds and a lower proportion (48%) went into these occupations themselves. Of those with more than secondary school education, less than half were from manual and lower blue-collar occupations, while the vast majority (82%) went into upper white-collar occupations.

Downward mobility, on the other hand does not result in a corresponding linear association with education or income origins. Figure 7.2 above shows that whereas downward mobility is least among persons with some University training (3.8%), persons with an intermediate amount of education (11 years) have a disproportionately high tendency to move down from their income origins - 19.1% compared with 7.6% downward mobility for those persons with less than 7 years of education.

The reason for highly educated labour to suffer less downward mobility than other groups may well be that they are a highly select

group anyway, as evidenced by their educational credentials and their higher income origins. And, of course, as high-level manpower has been in short supply in Kenya, this group was particularly advantaged. But the underlying explanation for persons with a medium amount of education to suffer the experience of moving downward a long way from the economic level on which they were raised is less clear.

On the assumption that this disproportionate downward mobility was likely to be related to recent reductions in demand for intermediately educated labour, we separated this group by length of employment in the wage labour market and confirmed that there was greater downward mobility during the recent past: 1969-1980. And this greater downward mobility occurred despite the fact that the income origins of these individuals was quite high: more than two-thirds of the group came from non-farm origins.

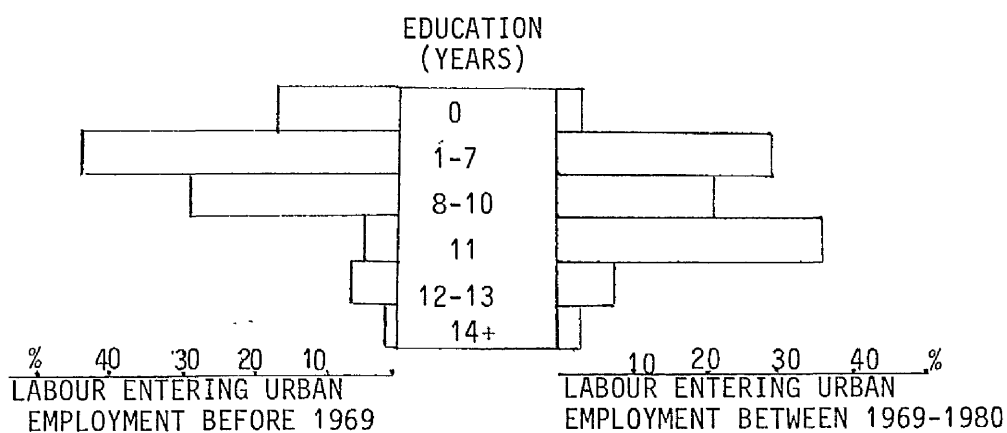
One possible explanation for the relatively high downward mobility of men in the intermediate educational brackets is the fact that their education was not quite commensurate with their high income origins. Hence the danger of downward mobility inherent in a high starting point was not neutralised by superior educational attainments.

The lower the level from which a person starts his career, the greater is the probability that he will be upwardly mobile simply because many more occupational destinations entail upward mobility for men with low origins than those with high ones. Although a man's income origins - as given by his father's occupation - predispose

his movement to certain occupational destinations, it is his own training and experience which ultimately prepare him for his career and define his advantages in applying for jobs occupationally higher in status or income than that of his father.

The greater downward mobility of persons with an intermediate amount of education coupled with their higher income origins suggests that the two influences - parental occupation and educational attainment - are not cumulative in their effect on lifetime incomes. The influence of father's occupational status on son's career is mediated by the son's educational attainment. Thus it may be that the most educated persons have the educational qualifications to match their income origins, and the least educated have less in the way of income origins to live up to. It is the intermediate category who have not quite been able to match their educational achievements with their social origins who suffer the deprivation of social status implicit in the greater probability of downward mobility. It may also be that parents deciding on the income future of their sons should not simply look at the current pattern of wages and extrapolate forward, they must also look at how the size of the cohort entering the labour market with (the same educational skills as) their sons will affect their son's prospects. Figure 7.3 below indicates that the group

Figure 7.3: Distribution of Labour by Education Achieved.



with an intermediate amount of education (11 years) was by far the largest cohort entering the labour market between 1969-1980, a period of increasing downward mobility for all but the most highly qualified persons. The lower returns for this group (Sh. 2391 on average for the late entrants compared with Sh.4388 for the early entrants - see also Table 3.4 earlier) makes future entrants into the labour market likely to stay in school longer in an attempt to avoid similar exposure.

C. Social Capital and Intergenerational Mobility

We turn in this section to interactions between inherited social capital - what Becker refers to as 'genetically determined race, ability, and other characteristics, family reputation and "connections"' variations in human capital investments and intergenerational income mobility.⁶

The data on different ethnic groups in urban employment reveal their relative advantages in terms of upward and downward occupational mobility. It also exposes the impressive position of the Kikuyu tribe: they are more likely to be very upwardly mobile and less likely to be very downwardly mobile than any other ethnic group in the urban employment structure. In terms of upward mobility

Table 7.4: Mobility by Ethnic Groups

Ethnic Group	Percent very upwardly mobile	Percent very downwardly mobile
Kikuyu	91.1	4.6
Luo	74.1	10.0
Coastal groups	74.1	11.1
Asian	34.1	20.5
Kamba	77.4	11.3
Luhya	72.8	12.0

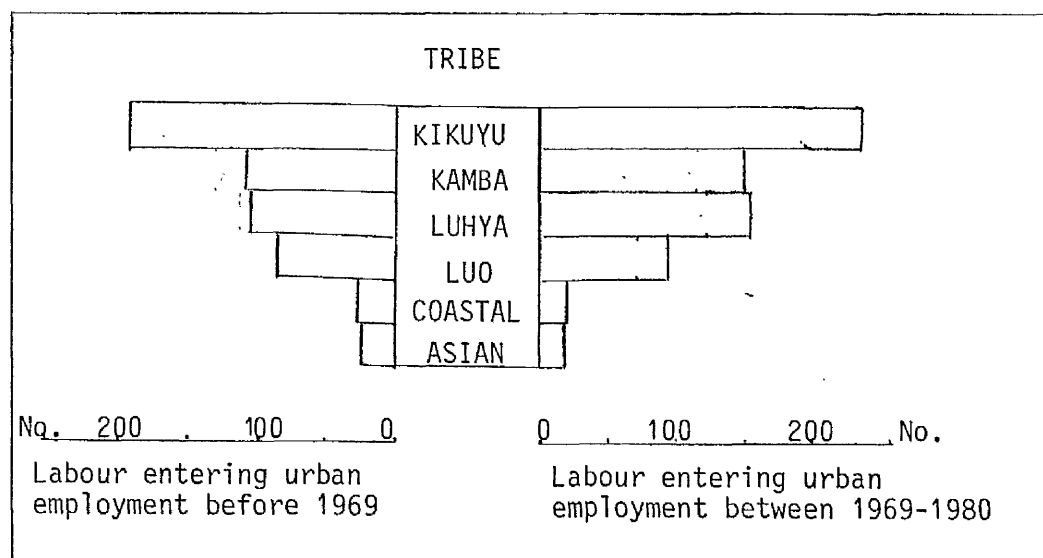
Source: Labour Force Survey, 1980

6. Becker, Gary S. and Tomes, Nigel., "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility", Journal of Political Economy, 1979, vol.87, no.6. p 1153.

this represents a difference of 13.7% between the Kikuyu and any other ethnic group.

The superior mobility of the Kikuyu compared with the Luo, Coastal groups, Kamba and Luhya, all of whom have roughly similar probabilities of upward mobility, raises the question of whether the gap between the Kikuyu is a result of their initial early advantages in the urban labour market, or whether the gap has been widening over time. It also begs the question of the extent to which this pattern of mobility has been conditioned by the different educational achievements among the ethnic groups. Educational handicaps inevitably create occupational (and income) disadvantages for members of different ethnic groups, but there can be additional career and income disadvantages which may be attributed to ethnic status and the discrimination it evokes.

Figure 7.4: Distribution of Labour by Ethnic Group and by date of entry into the Urban Labour market.



Source: Labour Force Survey, 1980

At first sight, the high upward mobility of the Kikuyu is rather surprising, keeping in mind their early and voluminous entry and consolidation of status within the urban wage sector - which history gave them a higher baseline position from which to be mobile. We had expected that the other tribes, given their much lower income and occupational origins would be (less likely to be downwardly and) more likely to be upwardly mobile than the Kikuyu, if only because the number of occupational positions which entailed upward movement were greater for them than for the Kikuyu. The findings in Table 7.4 above clearly, however, contradict this expectation.

One of the reasons for this lies in the fact that half of the Labour Force sample were recruited during a period in which access to the elite was facilitated by a considerable expansion of the wage sector, and in particular by an increase in the number of clerical and administrative jobs available to Africans. The policy of Africanisation of jobs, which effectively removed non-citizen European and Asian groups (particularly the latter) from their jobs and made these positions available to Africans, permitted excessively high upward mobility in those ethnic groups which had an advantage in terms of educational qualifications. Prior to 1969, Table 7.6 below indicates that the Kikuyu were the most educated group in urban employment. At least 14.4% of their number had secondary education compared with 9.3% for the Luo, 7.3% and 3.7% respectively for the Kamba and Luhya.

But the high upward mobility of the Kikuyu was also a direct result of privilege transference from one generation to another. Thus, for example, among the Kikuyu, occupational inheritance was the highest among all ethnic denominations. Table 7.5 below, which describes the proportions from different income origins entering white-collar occupations, by ethnic group, suitably expresses this phenomena.

Table 7.5: Comparative Mobility into the Elite

Ethnic Group	Percent of sons from given occupational origins themselves employed in white-collar occupations in 1980		
	Farm Origins	Manual or Blue-collar Origins	White-collar Origins
Kikuyu	30.6	47.8	80.4
Luo	22.3	29.8	42.9
Coastal groups	45.0	31.8	25.0
Kamba	17.3	24.7	33.3
Luhya	17.2	24.7	22.7
AVERAGE	23.8	36.9	60.5

Source: Labour Force Survey, 1980

The disposition of the Kikuyu to enter white-collar occupations is striking. Looking at the last column, the table indicates that approximately 80% of Kikuyu from white-collar origins themselves entered white-collar occupations, compared with 23% to 43% for the other ethnic groups. 48% of Kikuyu from manual origins entered white-collar origins compared with 25%-32% for the other ethnic groups. Indeed, the only category in which the Kikuyu were relatively disadvantaged concerned men from farm origins, but this was probably because fewer Kikuyu within our sample were from farm origins than in the other ethnic groups.

Looking along the rows, Table 7.5 above also expresses the relative difficulty with which men from farm origins have reached white-collar occupations - a phenomena of great social significance, evidencing as it does, a high degree of occupational solidarity within white-collar occupations. The Average row at the bottom of the table indicates that it is easier for men of white-collar origins to enter white-collar occupations than it is for men from manual, blue-collar or farm origins. Clearly the top grade has been recruited primarily from within its own ranks, and this association is most striking among the Kikuyu, although it exists for every ethnic group except the Coastal groups. It is certainly possible to conclude that both ethnicity and occupational origins have been important in the labour recruitment process.

The crucial factor in terms of equal opportunities for new labour entrants is whether or not labour entering the market is equally educated, regardless of their occupational or ethnic origins. As long as educational attainments from the different origins have been competitive, then the distribution of sons within each occupation of the wage structure should proportionately represent the different sex-ethnic-occupational origins of labour. There are two other forces, however, in addition to education, which would affect the distribution of sons within any occupational category.

Firstly, shifts in demand for workers, which increases the number of jobs in some occupations and decreases it in others, has a disparate effect upon the recruitment of labour from ethnic groups. Certain occupations in Kenya interest some ethnic groups more than others,

and a shift in demand would serve to exaggerate the imbalance. Thus, for example, although we did find a disproportionate amount of Kamba, Luhya and Luo within the lower occupational categories - in unskilled blue-collar work in particular - it was difficult to ascertain whether this distribution reflected different tastes or access to such jobs. Certainly most employers when interviewed felt that, educational credentials being the same, the Kikuyu (and to some extent the Luo) would hold out for longer in the effort to find a job which matched their original aspirations on entry into the job market. The Luhya and Kamba, on the other hand, would be more likely to lower their sights particularly if there was already a high proportion of employees from the same ethnic group already working for the prospective employer.⁷ Non-monetary remuneration or working conditions within the firm or compatibility with incumbent staff was more important to the Luhya and Kamba.

Secondly, differential fertility among the various ethnic groups changes the relative numbers of sons entering the labour market. An excessive degree of cross-generational occupational inheritance within white-collar occupations, would provide an advantage to those groups with a hold on such occupations. Ethnic groups with high fertility and a high proportion of sons in the elite would be able to consolidate their position in the elite. Some ethnic groups with lower fertility (or higher mortality) would be pushed out or quantitatively disadvantaged in entering certain occupations over time. Unfortunately we are unable to marshal any evidence regarding the fertility of different ethnic groups by occupation.⁸

7. This concentration of particular ethnic groups within firms was very striking in all the firms we visited. In the towns like Thika or Mombasa, one would expect a high proportion of some ethnic groups in view of the correlation between geographical area and ethnic origin. But in Nairobi, the proportion of any one ethnic group within a firm ranged from 50 to 95% in blue-collar and lower white-collar categories. Employers felt that such concentration was in their interest: it made for happier working relations and a more docile/manageable work force.

We turn therefore, to the matter of education, which has already been shown to increase upward mobility particularly at the highest levels of educational achievement. The Kikuyu with their higher socioeconomic origins might be expected to have acquired higher educational attainments than the other groups. There would also be the matter of school quality which has been shown to be positively correlated with higher socioeconomic origins. The Kikuyu, advantaged in being closer to the metropolis than other ethnic groups, and coming as they did from the most highly developed areas of the country, would be exposed to higher quality schools than other ethnic groups. This would improve their scholastic performance and their educational attainment.

And the mobility advantage of the Kikuyu expressed in Table 7.4 above would be the cumulative result of a continuous process of investments in human capital and of exposure to advantages in the labour market. The cohorts entering the labour market during the fifties and sixties - the current generation of parents - were particularly advantaged in entering the urban market at a time when barriers to African employment were being removed and when the rates of return to small investments in human capital were relatively high. This generation of Kikuyu labour appears to have maintained their advantage in the urban wage structure because of their high proclivity to invest in the human capital of their children. Other tribes have similarly invested in their offspring but their investments have been lower, perhaps because their rates of return have been lower, and they have not therefore attenuated the initial advantage of the Kikuyu in the labour market.

8. The Kenya Fertility Survey, 1977-1978 reveals that tribal variations in fertility are small except among coastal groups which have a lower total fertility rate. Total fertility rates by husband's occupation were only calculated for ever married women and this did not reveal very strong correlations between fertility and occupation.

Our sample of migrant employees does not permit fine inter-cohort comparisons for each generation of labour by ethnic group because the cell sizes would be too small to derive meaningful trends. We did, however, divide the sample into two artificial cohorts or generations, each of which would be subject to roughly similar demand conditions in the labour market. The characteristics of the two artificial cohorts are given in Tables 7.6 and 7.7 and these tables, by providing distributions of education, age and occupation by ethnic group, illustrate the investment differences between the Kikuyu and other groups.

As expected, the early cohort, defined in terms of persons entering the labour market before 1969, has an older age structure than the later cohort which entered the market during the seventies. Half the sample of respondents in the early cohort were over 40 years old, whereas over 60% of the later cohort were between 20 and 40 years old. (See Figure 7.1 earlier).

A comparison of Table 7.6 and Table 7.7 shows that all ethnic groups have increased the human capital investments in their offspring. The Total columns show that for the early cohort the majority of respondents were in the lower education categories: 43% had some primary schooling while at least 16.7% had no schooling at all. By the seventies, however, although the whole education distribution had shifted upwards, the category of persons who had completed secondary school was disproportionately large - 46.3% . Since the ethnic distribution of labour within the early and late entering cohort is roughly similar (see Figure 7.4 earlier) it is possible to compare the educational investments for each

Table 7.7: Labour entering urban employment between 1969 and 1980

Table 7.6: Labour entering urban employment prior to 1969.		urban employment					Table 7.7: Labour entering urban employment between 1969 and 1980					
TRIBE	KIKUYU	LUO	COASTAL	KAMBA	LUHYA	TOTAL	KIKUYU	LUO	COASTAL	KAMBA	LUHYA	TOTAL
(N)	(194)	(82)	(22)	(109)	(107)	(536)	(243)	(88)	(24)	(148)	(151)	(654)
OCCUPATION ORIGINS	%	%	%	%	%	%	%	%	%	%	%	%
Farm-rural	62.5	63.5	45.5	75.2	68.3	63.5	42.0	48.8	37.5	56.1	49.0	46.2
Unskilled	18.5	9.8	9.1	10.1	9.4	12.6	14.4	10.2	16.6	14.9	20.5	14.9
Blue-collar	15.9	18.2	40.9	11.0	17.7	18.3	29.2	25.1	33.4	27.0	19.2	26.0
White-collar	3.1	8.5	4.5	3.7	4.6	5.6	14.4	15.9	12.5	2.0	11.3	12.9
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
RESPONDENT'S EDUCATION												
None	17.5	10.9	18.2	27.5	14.0	16.7	2.5	4.5	8.3	4.1	1.9	3.1
1-7 years	38.7	41.5	50.0	38.5	59.8	43.0	21.4	21.6	25.0	43.9	37.7	29.6
8-10 years	29.4	37.9	18.2	26.7	22.5	28.0	22.2	25.0	8.3	20.3	20.6	21.0
11 years	5.7	2.4	9.1	1.8	0.9	4.5	43.6	33.0	54.2	27.7	31.2	36.1
12-13 years	8.2	6.1	4.5	3.7	2.8	6.3	7.4	12.5	--	2.7	8.6	7.7
14+ years	0.5	1.2	--	1.8	--	1.5	2.9	3.4	4.2	1.3	--	2.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
OCCUPATIONAL DESTINATIONS												
Lower blue-collar	26.8	34.1	13.0	43.2	42.9	32.8	22.2	32.9	12.5	44.6	41.7	31.8
Blue-collar	41.7	45.1	59.7	38.5	42.9	41.4	28.0	34.1	41.7	31.8	33.8	30.8
Lower white-collar	30.4	20.8	27.3	17.4	14.2	24.5	48.1	30.7	45.8	23.0	23.8	35.9
White-collar & prof.	1.1	--	--	0.9	--	1.3	1.7	2.3	--	0.6	0.7	1.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
MOBILITY DISTRIBUTIONS												
Long distance up.	65.3	79.2	8.3	88.0	56.2	68.3	76.5	55.9	76.5	54.4	67.9	66.1
Short distance up	23.7	--	--	6.7	28.8	16.1	2.2	16.9	--	29.7	21.3	14.5
Stable	2.5	1.9	8.3	--	5.0	2.6	7.2	6.9	8.8	3.3	5.7	6.4
Short distance down	3.3	5.7	16.7	--	2.5	3.2	1.6	3.4	--	3.3	1.7	2.1
Long distance down	5.2	13.2	66.7	5.3	7.5	9.8	12.5	16.9	14.7	9.3	3.4	10.9
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Labour Force Survey, 1980

cohort without controlling for size. The educational attainments of the Kikuyu are most impressive. Prior to 1969, although they were the most educated category in the labour force, only 14.4% of their number had completed secondary school. This can be compared with the attainments of the late-entering cohort, 53.9% of whom had completed secondary school, compared with 48.9% for the Luo, 31.7% for the Kamba and 39.8% for the Luhya. The higher education of the Kikuyu have clearly been the cause of their higher upward mobility and higher occupational destinations. 31.4% of the early cohort entered white-collar occupations, compared with 49.8% of the later cohort. Indeed, the Kikuyu and the Coastal groups were the only kinship groups to improve their upward mobility during the seventies. And, like the Kikuyu, the Coastal groups similarly improved their occupational position by their higher rate of human capital formation during the latter period.

D. Conclusion

The extent of intergenerational movement into and out of the top occupational grades is important for two reasons. Firstly, access to status and pay from below is a measure of equality of opportunities among the various ethnic groups. When particular ethnic groups in high income occupations can rely more and more on most of their sons or kinsmen succeeding them into such occupations, while other ethnic groups are unable to enter such occupations because of their lower human capital investments, then there is evidence to suggest that some ethnic groups will have high and stable incomes over later generations, while for other groups the sequence of changes in the incomes of children, grandchildren and later descendants will be great.

The evidence marshalled in this chapter goes some way to indicate that recruitment into the elite has not been proportionately represented among the different ethnic groups. The Kikuyu have, for example, experienced greater upward mobility and lesser downward mobility than any other ethnic group. To a large extent these experiences are the result of the geographical and educational advantages of the Kikuyu. History indicates that the size and timing of their entry into the wage labour market was unmatched by other ethnic groups. In addition, their physical proximity to the metropolis favoured them with the advantages of urbanisation. By investing slightly more than any other groups in the education of their offspring they have been able to take advantage of the downward movement in the demand for intermediately educated labour. And their superior educational credentials have been translated into superior occupational achievements. The high proclivity of this group to invest in the human capital of their sons has enabled them not only to maintain their initial advantage in the labour market, but to enhance it.

CHAPTER EIGHT

CONCLUSION

A. Introduction

Before, and very shortly after Kenyan Independence in 1963, the level of education obtained by an individual depended closely upon admission into one of the few missionary schools in the country, or upon the social status of his parents; social status being measured in terms of father's occupation. Crude economic, together with more subtle cultural -religious factors, accounted for major differences in educational achievements. But although there was an unprecedented expansion in the opportunities for educational investment once the racial and religious barriers to schooling had been removed, the discrepancies in educational opportunities as between individuals of different social-kinship origins have by no means been eliminated. Nor have they disappeared under the new system of "free" primary education for all. The more obvious inequalities have been removed by the abolition of fees at the primary level, by the standardised procedures of selection of pupils into the secondary school system, and by the provision of quota requirements in high-schools. But underlying economic inequalities still deny children from poor backgrounds the opportunities to fulfil themselves scholastically. The quality of schooling and therefore the level of scholastic achievement of children within a primary school is still heavily conditioned by the wealth of their parents - as expressed in their "voluntary" contributions to school development expenditures. And therefore the income returns from higher education remains relatively inaccessible to children from poorer backgrounds.

For the adults surveyed in 1980, educational level is not only related to social origins (parental occupation and income) but also to achieved social status, as measured in terms of the income or career the adults themselves had obtained. This finding was scarcely surprising; the increasing educational requirements of the developing professions and of the upper branches of government and industrial administration have made tertiary education a technical as well as a cultural necessity for occupations of high income and social prestige.

One fact is of importance, however. First, in the period prior to the institution of "free" primary education, income origins and educational attainments tended to interact to produce a close association between parental and child income. This was especially so for the higher income occupations, for which tertiary education was indispensable, or at least desirable. But the rise in the educational requirements of such occupations has more than kept pace with, and has undoubtedly been the logical outcome of an expansion in educational opportunities. Therefore, although education continues to be a powerful factor in the achievement of higher occupational income, it is no longer a sufficient condition in itself. Men with higher education and relatively high social (occupational) origins are now more likely to be upwardly mobile in their careers than men with a comparable education but lower occupational origins. Having a father of relatively high social status thus provides a double premium. This finding is important because it indicates that a person's earning capacity resulting from schooling alone cannot always be identified. Therefore it would be risky to continue to use education as a compensatory device for equalising the earnings of adults.

We conclude that the broad effect of the current educational policy - which has been based on the beliefs that an expansion of educational opportunities can achieve significant equality of economic opportunity without challenging the basic economic structure of the society and without requiring any major redistribution of capital - has been to reinforce pre-existing inequities. Underlying inequalities in access to tertiary education have not been removed. Indeed, what the present research shows is that measured in terms of the relation between the actual and expected number of men from poorer (farm) backgrounds in urban occupations (and high-income occupations) existing rigidities have been strengthened rather than eroded. On the contrary, the degree of difficulty in moving upwards from one income category to another has been increasing with an expansion of the educational system.

The general picture is one of a society in which economic status is inherited. Economic origins have conditioned educational levels and both have conditioned the level of earned income.

At present, there are at least two primary reasons for wishing to remove rigidities in access to high income occupations. First, it is desirable in order to increase economic and social efficiency since with a fluid structure there is more likelihood that positions which require high ability will in fact be held by individuals who possess high ability and who have not been additionally sorted out for other factors. A fluid structure is also more capable of adapting itself to internal and external change. Secondly, from the point of view of the individual, rigidities in the structure ensure that

there are more square pegs in round holes, and the associated denial of opportunity to rise in status provides fewer incentives for fuller utilization of personal capacities. Certainly it is one of the postulates of a democratic and egalitarian society that ability, whatever its social or cultural background, should not be denied the opportunity to fulfil itself.

B. Results

In general the findings from the present research can be summarised in four propositions:

(1) The income effects of education, except in the special case of University graduates, have fallen over time. However, the computed rates of return to education in 1980 tended to increase (rather than decline) with increments to schooling so that the highest returns to education were obtained at the highest levels of schooling and *vice versa*.

(2) These increasing rates of return to incremental investments in schooling have permitted families to maximise their returns from human capital investments in their children by producing a systematic improvement in the education of early-born children at the expense of middle-born and late-born children within a family.

(3) Variations in the economic status of families (and variations in the economic status of kinship groups) have been reflected in the distribution and effectiveness of primary schools between and within populations.

(4) The variance in the income of children from different families can be explained largely by their income origins and educational attainments. Indeed these two parameters tend to reinforce each other to produce a close association between parental and child income. Thus

inequalities are perpetuated from generation to generation.

(1) The Income returns from Education

A problem with computing the effects of education on income is that they vary from time to time or from cohort to cohort.

A comparison of the income returns to education between 1968 and 1980 revealed that they had, except in the special case of University graduates, fallen over time. Thus, 1968 entrants to the labour force had, on average, higher returns to their human capital investments than labour entering the formal labour market in the 1970's. The computed returns to education in 1968 were 26%, 32%, 23.8% and 27.4% for primary, secondary, high-school and University education respectively.¹ The corresponding rates in 1980 were 10%, 19.4%, 19.6% and 35% respectively.

The theory of human capital is above all, a theory of labour supply - or equivalently of the demand for education and training. If families deciding on the future of their sons in or about 1968 simply looked at the current pattern of wages and extrapolated forward, human capital theory would predict a sizeable investment (or demand) for all levels of schooling; if opportunity costs of capital were assumed equal and urban demand for educated labour were assumed constant for all groups, the highest returns and therefore the greatest demand for schooling would be realised at the completion of secondary education. But if the majority of families sought to maximise their earnings opportunities in this way, the increased total investment

1. Hans H. Thias & Martin Carnoy, Cost-Benefit Analysis in Education: A Case Study of Kenya, IBRD, John Hopkins Press, London, 1972.

in education and the greater volume of intermediately educated children supplying their labour to the market would effectively lower their prospects by bidding down the wage returns to all levels of education and the secondary level of education in particular. Variations in demand for labour would, of course, additionally alter the returns to education. Our analysis of labour response to the 1968 rates of return to education reveals that on the whole this is what happened: the larger size of the cohort entering in the 1970's diminished their future prospects by reducing the income returns to education in 1980.

The only cohort to which this did not apply was the group of entrants with University education. This cohort was a special case for two reasons. Firstly, the cohort was relatively small in size and the majority of this cohort was from the Kikuyu tribe. Secondly, scarce, highly-skilled labour categories more easily command higher remuneration - a combination of their expected higher productivity and lower elasticity of substitution.

Because the reduction in benefits to education were most pronounced at the lowest levels of education and *vice versa* they effectively resulted in the observation of rates of return to education which *rose* with incremental investments in schooling - a phenomena which has had important consequences for the distribution of family investment resources in schooling.

It must be mentioned, however, that the low 1980 returns to primary schooling were not entirely the result of an increase in labour supply. One other factor lent its weight to produce the observed result: during the period 1968 to 1980, the State undertook a greater proportion of the true costs of higher and tertiary education, leaving the bulk of the true costs of primary education to be borne by the private sector. This division of expenditure between the family and the State, added to real differences between families in the costs of raising capital for investments in education not only resulted in much lower private rates of return to primary education (and higher rates of return to high-school and University education) but were effective in bringing about significant variations in the rates of return to schooling by ethnic group.

That higher private costs of primary education lower the private rates of return to primary education is an obvious point. Less obvious and therefore crudely measurable in its impact, was the combination of three distinct and related differences between families of different ethnic groups. Differing primary education costs, inefficient capital markets and differing occupational benefits to education created profound variations in ethnic rates of return to education.

In the absence of an urban wage income, parental access to a cash income to finance the education of their offspring has invariably depended upon the family's ability to produce an agricultural surplus.

But geographical variations in the agricultural potential of land and therefore real differences between ethnic groups² in their ability to raise the necessary capital for primary schooling has subjected the donor generation to variations in market constraints. Even if genetic endowments and family sizes were to be assumed constant across ethnic groups, the level of human capital formation was bound to vary among families in different ethnic groups merely because of differing discount rates.

Thus, we found marked inequalities between ethnic groups in their returns to incremental educational investment and therefore in their rates of human capital formation. The Luo, Kamba and Luhya obtained the lowest returns to primary education, while the Kikuyu and Asian groups obtained the highest returns to secondary and University education. Indeed, since most of the individuals with University education in our sample were from the Kikuyu tribe, the generally high average rates of return to University education has reflected the unique occupational achievements of that race.

On the whole, the rates of return to education for each ethnic group followed the general trend of rising rates of return with increased investments in schooling. The only exceptions to this experience were the Mijikenda and Kamba.

2. There is a very high correlation in Kenya between region of permanent residence (geographical area) and ethnic grouping. See Chapter 5, Table 5.3

(2) Asymmetrical Distribution of Human Capital Investments between Siblings

Although educational attainment, performance in school and experience in the labour market were found to have an important influence upon earnings, the single most surprising finding of our study was the direct *positive* influence of family size and structure upon the educational attainment and hence upon the income of urban labour. The significance of this effect was discovered by examining the allocation of resources and the distribution of income-earning opportunities within a family.

It has often been assumed that large families force parents to divide their time and resources between children so that they cannot expend as much as parents of fewer children on the training and education, on the guidance and support and therefore on the human capital of any one child. Rates of return to human capital which are initially higher than on other assets, allow education to become the first channel for investment in children. And, of course, falling rates of return to increased investments in human capital mean that households with scarce financial resources at their disposal will maximise their income returns by equalising human capital investments in a smaller number of children.

In developed countries - especially the United States - these interactions between scarce investment resources, falling rates of return to incremental education, rising actual and opportunity costs of children have been used to explain the rapid secular decline in fertility, the negative correlation between schooling and family-size, the lower fertility and higher schooling of American Jews, recent declines in rural-urban fertility differentials and the relationship between child-mortality and fertility.

But although the framework of the family has been found to be important and useful in analysing differences in human capital investments between siblings, the assumption that large families universally depress career chances must be revised in the light of evidence for Kenya.

The argument for looking at the distribution of human capital resources between siblings obtained because of the finding that our sample of urban employees, although randomly selected, consisted largely (95.3%) of rural migrants, and 64% of these were first, second, or third born siblings of their families who had obtained higher educational qualifications than their peers lower down in birth-order than themselves and had subsequently migrated to the city to increase their earning potential. The skewed parity and educational distribution of these migrants led us to look closer into the distribution of educational resources within a family.³

As family size increases, the options for investment in education are

3. Such a finding need not, of course have reflected an asymmetrical distribution of resources within a family. It might merely have meant that there were two types of family: those of small sizes able to make high and equal human capital investments in their children, and those of larger sizes, equalising investments at a lower educational level. But then, family size would have a *negative* effect in a regression on education. Our regression showed the opposite: a positive effect.

either to share out the financial resources evenly among all children, or to concentrate available resources on some children at the expense of others. An important aspect of human capital investment is that it must be made in the early stages of the life-cycle if it is to do any good. If one hypothesises that parents make investment decisions in such a way as to maximise future family income, then rising rates of return to schooling imply that the income returns from schooling will be maximised when parents concentrate their resources on the education of their first-born children.⁴ For in so doing they maximise their income at an earlier date.

An asymmetrical pattern of resource allocation within a family - a result of scarce family investment resources and rising rates of return to incremental education means that the future educational and occupational chances of children are affected not only by the number of siblings they have but also by their position among their siblings; indeed these two factors (number of siblings and birth-order) might interact in their effects upon education and future income.

An analysis of the data for Kenya provided strong evidence for the expected interactions, for the asymmetrical distribution of human capital resources between children and for the generally *favourable* influence of family size on the educational achievement of low-parity siblings. In general we found that as family size increased, the probability of completing any educational level increased for first-born siblings and decreased for middle and late-born siblings.

Where completed family size was small, the probability that a first-born child would complete primary education was 47.8%, compared with 30.7% for the second child, 17.4% for the third child and 10.0%

4. Assuming, of course, that ability endowments are symmetrically distributed among siblings. An asymmetrical distribution of these endowments or varying child-mortality rates would, of course, modify the observed result.

for the youngest sibling. In short, mean educational attainments decreased with increasing parity.

Where the completed family size was intermediate, the distribution of human capital resources was found to be still in favour of the oldest siblings, but the differences between low, middle and high parity siblings was much greater at all educational levels. The probabilities were 64%, 32% and 4% for low-parity, middle-born and high-parity children respectively. Since the largest proportion of the labour Force Sample came from intermediately sized families (4-7 siblings) the relationship was an important and a dominant one.

Where the completed family size of the individual exceeded 9 siblings, an interesting relationship began to reveal itself. First-borns were still better off in terms of educational attainments than their younger siblings; middle-borns were no worse off than they were before, but the balance had begun to tip in favour of the youngest sibling. In these very large families, the lower a child's position in birth-order, the more did the balance of receiving human capital resources (perhaps from older siblings now employed in the urban sector) turn in his favour, and the less disadvantageous it was therefore to have many older siblings. To view it from a slightly different perspective, in very large families, individuals in the two extreme positions were advantaged in the human capital resources invested in them, and this showed up in their asymmetrical educational and income attainments.

Since educational achievements become manifest in occupational and income attainments, the interpretation that suggested itself was that

the future income interests of middle and late-born siblings within a family are to some extent deliberately set aside by parents in order to maximise future income at an early date. One can imagine that as long as there is a positive correlation between education and income, and as long as the income returns to education improve with additional investment, the utility-maximising family will decide to trade-off equity with efficiency and promote the educational attainments of early borns in order to increase their probability of migration and their chances of urban success. Asymmetrical innate endowments between siblings would, of course, modify the rates of return to education. As would the sex distribution of siblings within the family. Thus, for example, among strong tribal and kinship groups where land, and the power associated with it is not inherited by sons until the death of the father, the parental generation is able to exert a strong psychological and economic hold over the wage earnings of their first-born sons. This hold of the older generation over the first-born sons would lower the risk that they would prove ungrateful and refuse to support their parents and their younger siblings once a position of advantage was obtained in the urban sector, and it would simultaneously raise the expected rates of return to education of the early-born sons. Similarly, if the first-born children were females, investment in their human capital might not be as high because female migration to urban centres often reflects male migration or employment patterns, and because the wage returns to female labour is not as high as that of men.

From their position in the urban labour force, the advantaged early-born siblings might be induced by the family to compensate

their younger siblings in terms of both human and non-human capital investments. Our view is that the process may be circular: the heavy flow of remittances from migrants is often aimed at paying the school fees of their youngest siblings, which in turn stimulates further migration as these siblings try to emulate the experiences of their older brothers. Indeed, the asymmetrical distribution of human capital resources within families not only acts as a spur to migration, but the homeward flow of remittances to families becomes a means by which the success of one generation is consolidated by financing, motivating and enhancing the educational achievements and migration of the next. Possibly as more of the older siblings obtain employment in towns, a larger network becomes available to extended families; this too facilitates migration given the importance of relatives in finding jobs and supporting relatives when they first come to town. Indeed the binding link between education, urban earnings and homeward remittances probably also makes the wider community more willing to privately finance the education of its offspring. For the benefits of that education will accrue not only to the individual in whom it is embodied but will benefit parents and younger members of a family.

(3) Unequal rates of Human Capital formation between Groups

The concept of a vicious cycle of poverty implies not merely that growing up in lower economic strata adversely affects educational and income attainments, but more specifically, that the various conditions associated with low economic origins reinforce each other and have cumulative adverse effects on income chances. There are underprivileged groups in Kenyan society who suffer serious income disadvantages as the result of cumulative handicaps which

affect their rates of human capital formation. The case of three ethnic groups - the Kikuyu, Luo-Luhya and Mijikenda - illustrate the differences between communities in their propensities to invest in education.

The Mijikenda live in the Coast Province, the Kikuyu in Central Province and Luo in Nyanza Province. The Mijikenda have lower income origins than either the Kikuyu or the Luo and they receive less education. They have fewer primary schools, and a greater distribution of 'less-efficient' primary schools than the other two tribes. Even when Mijikenda, Kikuyu and Luo with the same amount of education are compared, the Mijikenda achieve lower occupational status. And even when these differences are statistically controlled and we ask how the Mijikenda would fare if they had the same education and occupational origins as the other tribes, their chances of income attainment are lower than the other ethnic groups. The multiple handicaps associated with being of the Mijikenda tribe may therefore be cumulative in their adverse effects on income. Although we have used the Mijikenda as an illustrative example, the effect of low economic origins applies to other groups like the Kamba, who live in poor regions. Regional development, we found, placed a strong and consistent limitation upon the access and choice of schools. The process of assortment was effective in bringing about a systematic gradation of average educational achievement by region and therefore by tribe. Within regions, further assortment took place by occupational origins and by schooling quality.

Our findings indicate that there is a strong association between the socioeconomic level of a community and the scholastic capability developed by their children. It was not possible to identify the means by which the community imparted skills to their children; it may be that children from higher income strata are let to develop the attitudes, interests and habits of mind which enable them to profit by schooling. They may have been made to feel that their parents want them to do well at school, and that ways of advancement in life are open to them if they do so.

What is crucial is the fact that differences in scholastic achievement by socioeconomic level are reinforced by the qualitative differences in the provision of educational facilities between groups. The expanding private role in the allocation of schooling resources has increased relative inequalities in access and quality of schooling between socioeconomic and kinship groups, because it has permitted those groups and families at the top of the socioeconomic structure (which groups appear to come from particular ethnic-geographical origins and have long perceived the private benefits of investment in education) to allocate their resources in education more efficiently, to make greater cumulative investments in education and to impart some of their inertia to the schooling system, thereby changing its efficiency and allowing them to obtain higher returns to their investments in education.

We did not, of course, find irrefutable evidence that high-achieving schools were clustered within communities of high socioeconomic status. One would need time-series evidence for this purpose. But we did find prima facie evidence that unusually effective schools existed and

were geographically clustered in highly developed regions. Students going to highly-effective schools came from higher socioeconomic backgrounds than students in other primary schools; parents of pupils who went to high-achieving schools had more education (and therefore income) than the parents of children in low-achieving schools. And the top schools were associated with more experienced teachers, highly-trained teachers and with higher private development expenditures. Children from higher socioeconomic backgrounds were therefore more likely to achieve superior school performance and consequently permit their parents to make higher investments in their human capital than their peers from disadvantaged communities. Thus, varying scholastic yields between communities - the result of a complementary relationship between community resources and school effectiveness - was translated into different rates of human capital formation and future community differences in income.

The extent to which higher scholastic yields and consequently higher rates of return to cumulative investments in education are obtained by individuals from lower socioeconomic origins and ethnic groups is of great social significance in Kenya. Society appears to be moving towards one of entrenched privilege if few people from low-income origins can expect to move out of it. And our findings suggest that children from lower occupational origins in less developed regions, when compared to their peers in other areas, are less likely, because of their lower probabilities of scholastic achievements, to move upwards from the income classes into which they were born. The process may be self-perpetuating. Just as they are constrained by their poorer income origins, their

own offspring will be so constrained.

Investments in human capital cannot readily be financed by borrowing and usually are self-financed by parents. Differences between groups of families in rates of return, average endowments or other parameters raise inequalities in income and stretch out its distribution because these differences interact with income. Families (or communities of families) with higher propensities to invest in education would have higher future incomes, an interaction which raises inequality and skews the distribution of income to the right even if all other parameters were symmetrically distributed.

Our findings that families from lower economic origins have lower propensities to invest in the education of their children and *vice versa*, suggests that the coefficient of variation in income between children of a single generation could be quite large, while the sequence of changes in incomes between parents, children, grandchildren and their descendants could be quite small as long as the fortunes of children are linked to their parents through human capital investments.

(4) Intergenerational Mobility and Educational Investment

Intergenerational mobility describes the effect of a family on the well-being of its children. The term 'inheritance' is commonly restricted to non-human capital, although a wider concept would include financial, human and 'social' capital bequests to children.

Ideally, in an analysis attempting to trace long-run income stability within a given family, or in an analysis attempting to follow the process of transmitting advantage from one generation to another, it would have been desirable to have time-series data on families. One could then trace the effect of financial, human and social capital endowments from one generation to another and measure the extent to which apparent changes in the relative resources of the parental generation tend to be offset or matched by changes in bequests to children. Although we had intergenerational data on educational investments, and, of course, ethnic origin, we did not have income data for the donor (parental) generation and had therefore to pursue an analysis of the intergenerational transmission of advantage by looking at the effects of parental occupational status, ethnic origin and human capital investments on child income, where occupational status of parents was used as a proxy for their income.

One important finding of this analysis was that higher income urban opportunities were rapidly becoming limited to the sons of fathers who were already part of the elite. In other words, families who were relatively well-off were able to maintain and even consolidate their wealth, while families who were less well-off were unable to raise themselves from the income origins into which they were born. We found, for example, that a decreasing proportion of farm sons and an increasing proportion

of sons from white-collar backgrounds were employed in urban occupations and high-income occupations in particular. Thus long-run income stability increased for descendants of the elite and decreased for other groups because of a strong correlation between the upward mobility of sons and the occupational -or income - status of their fathers. Especially significant was the fact that this correlation between the occupational status of fathers and the occupational status of their sons was increasing over time, suggesting that the degree of difficulty in moving upwards from one income category to another was also increasing.

It was discovered, for example, that the first generation of entrants into the labour market (the pre-1968 cohort) were approximately twice as likely to enter occupations which were higher in income status than that of their fathers, compared to the later cohort (1968-1980 cohort) of labour market entrants. This decreasing upward mobility was particularly prevalent among sons of poorer origins and was the result of two patterns: an overall reduction in recruitment of labour from farm origins and a higher propensity of parents in wage occupations, when compared with parents in farm occupations, to invest in the human capital of their sons. More than two-thirds of white-collar employees recruited between 1969 and 1980 were the sons of white-collar or professional workers themselves, compared with 50% prior to 1969. And the higher rate of recruitment of white-collar sons was largely a consequence of their higher rate of human capital formation, itself a product of their higher social origins.

Increased education was found to be of primary significance in enhancing general upward mobility in the occupational structure, and the relationship was linear. Thus, irrespective of the income origins of an individual, the greater his educational attainments, the higher were his chances of moving into occupations of higher income status than that of his father. But those children who came from high income origins and had very high educational achievements, were more upwardly mobile in the labour market than their peers with the same education but lower income origins. This meant that although education was important in its effect on earned income, educational investment alone was necessary but insufficient; an additional premium could be earned through the positive effects of social origins on child income.

However, the two influences - parental wealth and educational attainment - were not necessarily cumulative in their effect on the lifetime incomes of children. The effect of the former was always constrained by the value of the latter. To be highly upwardly mobile, a labour entrant had to have completed the required level of education for the job, however helpful his father's status might be in acquiring the job.

Therefore, the income attainments of sons depended primarily upon their scholastic yield (and therefore innate endowments) and on their willingness to stay in school longer. High parental income identified an ability to pay for the desired level of

education; it did not always identify parental ability to promote the higher educational attainments of their children. Where parents were relatively wealthy (i.e. from high occupational origins) and were successful in promoting high educational attainments in their children, the combined income effect of the two parameters was considerable. We found, for example that with few exceptions the cohort of University educated sons came from the highest income origins and earned incomes greater than those obtained by any other group. But since we also discovered that the cohort of intermediately educated sons -- who came from the same high income origins as the University educated sons--were more downwardly mobile than any other group, and therefore suffered the deprivation of income status implicit in a greater probability of downward mobility, the clear implication was that while parental achievement or associations in the labour market facilitated or improved employment conditions of sons, they did not overshadow the direct effects of investment in human capital on income.

And therein lay the advantage of the Kikuyu in the labour market. Among the ethnic groups we surveyed, the Kikuyu had the highest propensity to be upwardly mobile, and the lowest propensity to be downwardly mobile in their career achievements. These patterns appeared to be the decisive result of their higher rate of human capital formation and their high social origins, a product of their early entry into the labour market.

The early entry of the parental generation of Kikuyu into the urban labour market enabled them to profit from the high demand for industrial labour and the relatively high rates of return to all levels of education. Their resultant high and stable wage income and occupational status in the urban structure undoubtedly increased their bequests of social capital to their sons, and increased their propensity to invest in the human capital of their children. By 1980, the Kikuyu had the highest educational achievements among all the tribes being surveyed - a factor which, irrespective of their high social origins, has dominated their ascent in the pursuit of wealth.

A P P E N D I C E S

LABOUR FORCE SURVEY QUESTIONNAIRE

1. Name _____ Sex / Male / Female /
2. Year of birth _____
3. Place of birth _____
4. Country of citizenship
 Kenya _____ Other E. Africa _____ Other (specify) _____
5. Ethnic origin: African _____
 Asian _____
 Arab _____
 European _____
 American _____
- If African, what tribe? _____
6. How many children did your natural mother have, including you?
 Total _____ boys _____ girls _____
 How many of these are older than you? _____
 How many of these are younger than you? _____
7. For how many years have you been in this city?

EDUCATION

8. How much schooling have you finished?
- Primary /1/2/3/4/5/6/7/8/ years
 Type of school: Government maintained _____
 Mission _____
 Private _____
- Were you a boarder? / Yes / No /
 Name of School _____
 Province _____
- Secondary /1/2/3/4/5/6/ years
 Type of school: Technical _____
 Government Aided _____
 Harambee _____
 Mission _____
 Private _____
- Name of school _____
 Province _____
 Were you a boarder? / Yes / No /

Training: Yes No Completed Yes No
 Type _____ Incomplete Yes /

University: Yes No

If YES, Name & location _____
 Degree(s) completed _____
 Subject of degrees _____

Examinations attempted:

/CPE/KPE/KASCE/KJSC/CSC/EACE/GCE/HSC/EAACE/

P	P	P	I	I	1	1	
F	F	F	II	II	2	2	P = Pass
			III	III	3	3	F = Fail

9. When you were in primary school how many
 Adults (over 18 years) were there at your home? _____
 Children (under 18) were there at home? _____
10. Are you following any courses now? Yes No
 If YES, what courses? _____
11. How old were you when you left school _____ years
 (OR) give the year you left school _____
12. Why did you leave school?
13. Did you ever repeat any classes when you were at school?
 Yes No
 IF YES, which classes? _____
14. What was the average class size when you were in primary
 school? _____

BACKGROUND

15. Where did your father grow up?
 Kenya: Province _____
 Other country _____
16. How many years of school did he finish?
/None/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/ years
/Dont know/
- If none, or Dont know: Could he read and write? Yes No /
 If COMPLETED 13 YEARS: Did he go to College or
 University? Yes No /
 If YES _____
 What degree did he get? _____
 Which College? _____
17. What was his usual job when you were in primary school?

18. How many years of school did your natural mother finish?
 /None/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/years
 /Dont Know/

If None or Dont Know: Could she read and write? /Yes /No /

If COMPLETED 13 YEARS: Did she go to College or University? /Yes /No /

If YES What degree did she get? _____
 At which College? _____

19. What was her usual job while you were in primary school?

OCCUPATION

20. How long have you been with this firm? _____ yrs _____ months

21. Do you have more than one job? /Yes /No /

IF YES

What is the other job? _____
How much do you earn in it? Ksh /Week/month _____
Do you work for /YOURSELF/ or /SOMEONE ELSE/ _____

22. Are you self-employed in any job?

IF YES

Do you employ other people? /Yes /No / If yes, about how many? _____ How long have you been in this kind of work? _____ years _____ months Does it bring in a steady income or does it change from year to year? /Steady / Changes / What is your income from this job? Ksh /Week/month _____

23. In what year did you start full time regular paid work?

24. What were your previous jobs?

<u>Type (Describe responsibilities)</u>	<u>Year</u>	<u>Place</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

25. What is your present job?

26. How did you hear about or obtain employment with this firm?

27. Have you been unemployed for any period of time during the past 5 years?

IF YES

For how many weeks <u>each year</u> were you without work and looking for work?		
<u>Weeks not working</u>	<u>Year</u>	<u>Reasons</u>
	1979	
	1978	
	1977	
	1976	
	1975	

28. Are you /SINGLE/MARRIED/DIVORCED/SEPARATED/WIDOWED/?

If MARRIED

<p>Is your <u>/husband/wife/</u> working or earning any money now? <input type="checkbox"/> <u>Yes</u> <input type="checkbox"/> <u>No</u> /</p> <p>If YES, what work does he/she do? _____</p> <p>How much does he/she earn? Sh per/week/month/ _____</p>
--

29. Do you have any children? /Yes /No /

IF YES how many?

Sex	Age	Sex	Age	Sex	Age	Sex	Age
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

30. Have you ever had an illness which limits the type or amount of work you can do? /Yes /No /

If YES describe this condition _____

31. Did you pay out any money to help support anyone last month? (friends, parents, relatives, children)?

If YES, how is this person related to you? _____
and how much did you pay out? Sh. _____ month

32. Do you belong to a Trade Union? /Yes /No /
which? _____

33. Do you have a shamba at home? /Yes /No /
If yes, how big is it? _____

34. What is your salary in this firm (wages without tax)
KSh per month _____ VERIFICATION BY EMPLOYER

35. Do you have housing provided, or a rent allowance /Yes /No /
If Yes, what is the value of the housing or rent allowance?
Sh. per month _____

Factor 1 : EDUCATION

None	Up to 7th Yr.	'O' Level	'A' Level	University or Equivalent
Points 0	10	30	55	75

Factor 2 : EXPERIENCE

- 3 months	3-6 months	6 months - 1 year	1 - 2 years	+2 - 5 years	Over 5 years
Points 10	20	30	40	60	75

Factor 3 : SUPERVISORY RESPONSIBILITY

None	Little to none	Supervises small groups	Supervises large groups	Directs Dept.
Points 0	10	20	30	50

Factor 4 : DECISION MAKING

None	Minor decisions infrequently	Minor decisions frequently	Occasional decisions of initiative	Frequent creative decisions
Points 0	5	10	15	25

Factor 5 : MENTAL EFFORT & ADAPTABILITY

Simple routine work	Repetitive work of some effort	Minor effort for range of work	Constant mental effort of some change	High concentrated effort
Points 10	20	30	40	50

Factor 6 : TECHNICAL SKILLS

None	Below average	Average	Occasional above average	Constant high degree of skill
Points 0	10	30	50	75

Factor 7 : PHYSICAL EFFORT

Low	Infrequent medium	Constant medium	Infrequent high	Constant high
Points 5	10	15	20	25

Factor 8 : CONTACTS WITH OTHERS

None	Routine	To obtain information & advise	To advise seniors and influence decisions	Negotiating & making decisions
Points 0	5	15	20	25

Factor 9 : RESPONSIBILITY FOR SAFETY

No danger	Personal minor injury	Specific safety precautions	Handling dangerous substances	Concerned with procedures dangerous to many
Points 0	5	15	20	25

Factor 10 : FINANCIAL RESPONSIBILITY

None	Up to £100	£ 101 to £2000	£2001 to £5000	£5001 to £10,000	Over £10,000
Points 0	5	10	15	20	25

Factor 11 : RESPONSIBILITY FOR CONFIDENTIAL INFORMATION

No Access	Some minor records	Occasional access to major records	Constant access to highly confidential information
Points 0	10	15	25

Factor 12 : WORKING CONDITIONS

Normal Office	Emergency calls out of office hrs.	Above average fumes, noise, heat	Excessive noise, heat	Dangerous working conditions
Points 0	10	15	20	25

8. Brothers and sisters from the same mother as you living with you

<u>First name</u>	<u>Age</u>	<u>Sex</u>	<u>Living with you?</u>	<u>Same Mother?</u>	<u>Education</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

9. Brothers and sisters not living with you

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

10. Brothers and sisters from the same mother as you, not alive

<u>First name</u>	<u>Age</u>	<u>Sex</u>	<u>Year born</u>	<u>Year Died</u>	<u>Education</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

12. Language you speak most at home

Kikuyu _____ Luo _____
 English _____ Other _____
 Swahili _____

12. How often are you sick?

1. Less than one day each month _____
 2. About 2 days each month _____
 3. About 3 or more days each month _____

13. Is your natural mother alive?

1. Yes _____ 2. No _____ 3. I dont know _____

14. Is your father alive?

1. Yes _____ 2. No _____ 3. I dont know _____

15. Do your parents live together?

1. Yes _____ 2. No _____

16. As far as you remember, has your father always had a job?

1. Yes _____ 2. No _____

If no for how long was he at home looking for a job, and/or
for how long did he not have a job?

_____ years _____ months

17. About your father, describe the kind of work he does and say how much (approximately) he earns each month.

18. Did your father do any other kind of work?

1. Yes _____ 2. No _____

If yes, what other kind of work?

19. Who owns the land where you live now?

1. Your father or family _____ (Describe)

2. Someone else _____ who? _____

20. If your father owns land (anywhere in Kenya), how many hectares of land does he own? _____ hectares

(If you are not sure, say 'about ... hectares')

21. What crops does your family grow on this land

Which of these are sold in the market? (Circle those sold)

22. Does your family own any livestock?

1. Yes _____ 2. No _____

If yes, what livestock, and how many?

23. Does your father own a business? Is he a trader?

1. Yes _____ 2. No _____

If yes, describe the business, briefly

23. Your house What is it made of?

Mud _____ Wood/sisal _____

Brick/Stone _____ Iron _____

Other _____

Does your house have electricity?

1. Yes _____ 2. No _____

Do you have piped (tap) water in it?

1. Yes _____ 2. No _____

Do your parents pay rent to anyone for the house?

1. Yes _____ 2. No _____

24. What is your religion?

How often do you go to mosque/church?

1. Never _____

2. Once a week or more _____

3. Once a month or more _____

4. Once or twice a year or on special occasions _____

5. Less than once a year _____

25. Who in your family has the most amount of education and how much?

26. Can your father read and write?

1. Yes ___ 2. No ___

If yes, what amount of schooling did he complete?

___ I dont know

___ None

___ Primary: Standards 1-3

___ Primary: Standards 4-8

___ Secondary:Form 1-2

___ Secondary:Form 3-4

___ High school: Form 5-6

___ Teacher training college

___ University or more

What is the highest certificate that he has obtained?

27. Can your mother read and write?

1. Yes ___ 2. No ___

If yes, what amount of schooling did she complete?

___ I dont know

___ None

___ Primary: Standards 1-3

___ Primary: Standards 4-8

___ Secondary:Form 1-2

___ Secondary:Form 3-4

___ High school:Form 5-6

___ Teacher training college?

___ University or more?

What is the highest certificate that she has obtained?

28. What was your rank in class last term? _____

29. Is there anyone at home who helps or checks your homework? 1. Yes ___ 2. No ___

If yes, who? _____

30. Have you missed school this year?

1. Yes ___ 2. No ___

If yes, why? _____

31. Do your parents som etimes speak of what they would like you to do after you have finished your schooling?

1. Yes ___ 2. No ___

If yes, what? _____

31. How long does it take you to get to school?

_____ minutes

32. How do you normally get to school each day?

walking ___ bicycle _____ bus/matatu ___ car _____

33. Have you ever repeated any classes in school?

1. yes ___ 2. No ___

If yes, which classes did you repeat, and how many times?

Standard _____ Times repeated _____

Standard _____ Times repeated _____

Form _____ Times repeated _____

Form _____ Times repeated _____

34. Who pays your school fees?

35. How many miles is your school from your home?

APPENDIX C

Percentage distribution of Educational attainment by Birth-Order

Small Families: 1-4 Siblings

Birth Order	Educational Level					Total
	Primary	Lower	'O'Levels	'A'Levels	University	
1st born	47.8	34.5	35.0	37.5	50.0	42.5
2nd born	30.7	34.5	35.0	18.7	40.0	31.8
3rd born	11.4	14.5	20.0	25.0	10.0	14.2
4th born	10.0	16.4	10.0	18.8	-	11.5
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(N)	(140)	(55)	(40)	(16)	(10)	(261)

Source: Labour Force Survey, 1980

Intermediate Families: 4-6 siblings

1st-3rd born	64.4	69.4	62.3	54.2	66.6	64.8
4th-6th born	32.5	28.0	34.0	42.2	22.2	32.3
Last born	3.1	2.6	3.7	3.6	11.2	2.9
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(N)	(248)	(128)	(112)	(33)	(9)	(530)

Source: Labour Force Survey, 1980

Large Families: Over 7 siblings

1st - 3rd born	61.5	53.0	45.6	38.5	85.7	50.4
4th-6th borns	31.4	30.4	39.2	21.0	-	30.2
Last borns	7.1	16.6	6.2	40.5	14.3	19.4
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(N)	(169)	(115)	(125)	(38)	(7)	(454)

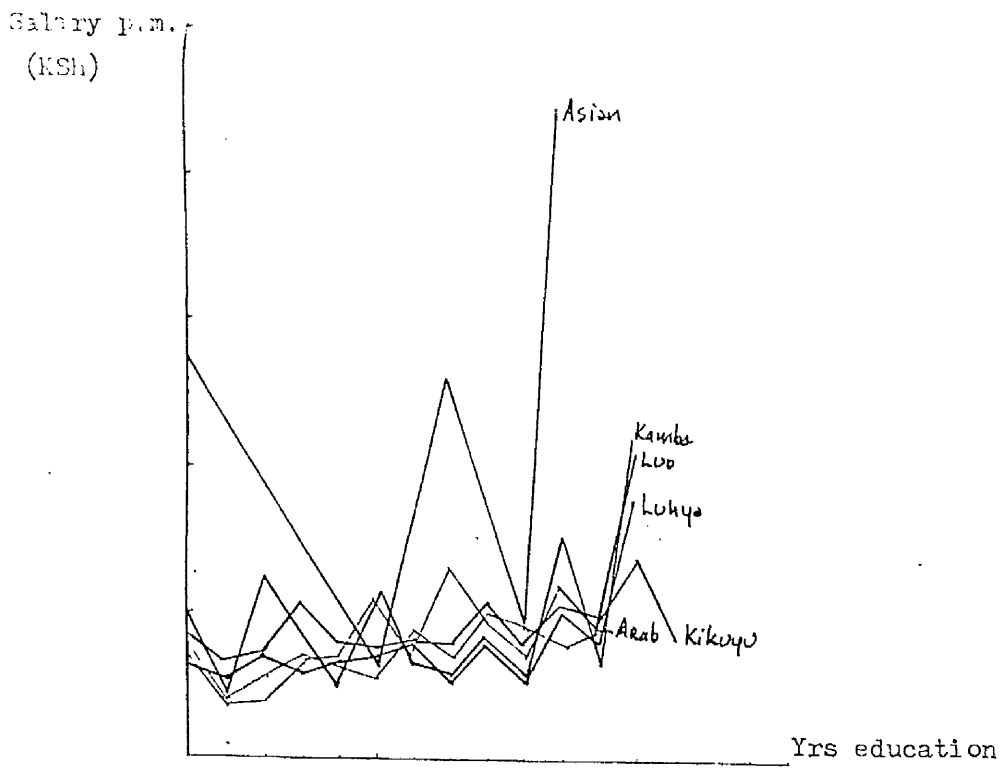
Source: Labour Force Survey, 1980

Table Mean Salary by Tribe and years of Schooling
FEMALE RESPONDENTS ONLY

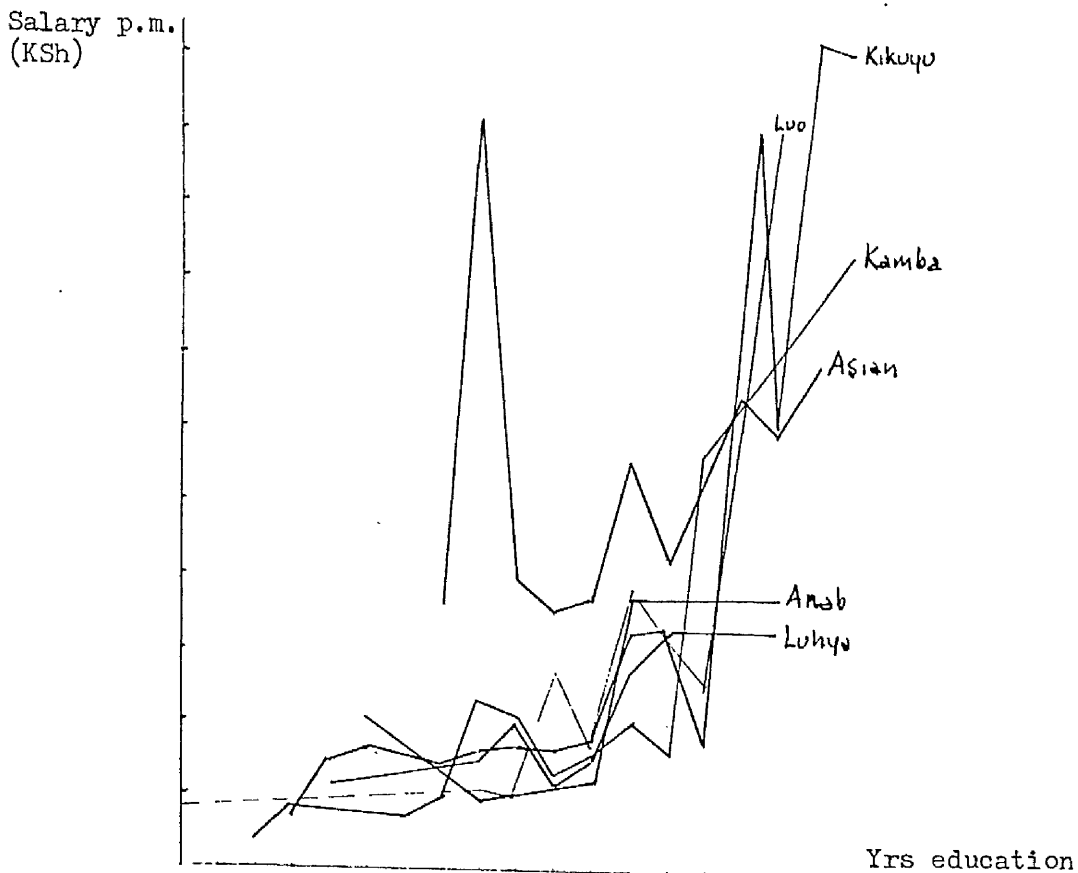
Years of Schooling	Tribe					
	Kikuyu	Luo	Arab	Asian	Kamba	Luhya
0	721.3	818.0	--	--	465.0	502.5
2	--	--	--	--	480.0	--
3	651.5	900.0	--	--	884.0	543.0
4	576.0	880.0	--	--	--	1015.0
5	704.0	--	--	--	--	--
6	--	--	--	--	410.0	--
7	1201.4	--	2200.0	1300.0	285.3	447.3
8	1376.5	1054.1	--	--	--	--
9	1255.3	--	--	--	--	300.0
10	1576.5	1182.0	--	--	--	1400.0
11	2047.9	2964.0	1000.0	3593.1	1255.4	939.5
12	4373.5	1300.0	--	5225.0	--	--
13	2222.5	--	--	1500.0	--	--
14	1738.0	--	--	--	--	--
15	--	--	--	5500.0	--	--
16	3040.0	--	--	--	--	--

Table Mean Salary by Tribe and years of Schooling:
MALE RESPONDENTS ONLY

Years of Schooling	Tribe					
	Kikuyu	Luo	Arab	Asian	Kamba	Luhya
0	878.1	786.7	996.0	2710	728.5	727.8
1	784.5	416.0	460.0	--	430.7	580.0
2	807.0	669.0	1305.0	--	467.0	790.1
3	1088.9	846.1	--	--	716.6	620.4
4	855.8	750.5	543.0	--	876.7	765.8
5	905.8	704.4	1374.0	870.0	1069.8	782.0
6	893.9	917.3	790.0	--	781.9	880.0
7	915.3	804.6	1222.3	4330.0	741.8	692.7
8	1294.2	1153.4	1057.5	10917	1149.2	985.7
9	1259.4	953.7	705.0	2488.0	843.5	711.1
10	1317.7	1748.3	1169.0	3875.0	1406.2	1087.0
11	1649.7	1304.7	1285.6	4866.3	1177.9	1140.4
12	2823.5	3353.8	3900.0	5900.0	2222.3	2544.8
13	3362.4	3386.7	--	5194.3	1690.0	2634.8
14	--	2684.0	--	--	5838.5	--
15	10080	6166.0	--	7368.5	--	--
16	9267.0	--	3916.0	--	--	--
17	11250	10000.0	--	6966.7	--	--
18	11000	--	--	--	8374.5	--

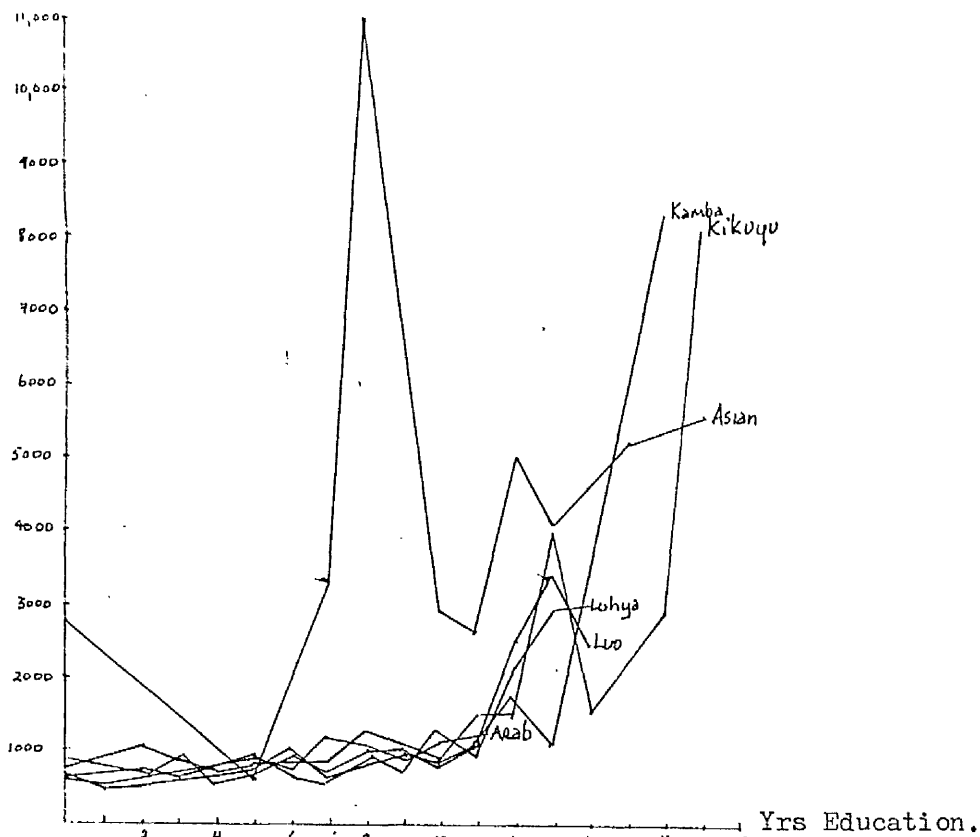


Mean income by education, Respondent's occupation = blue-collar



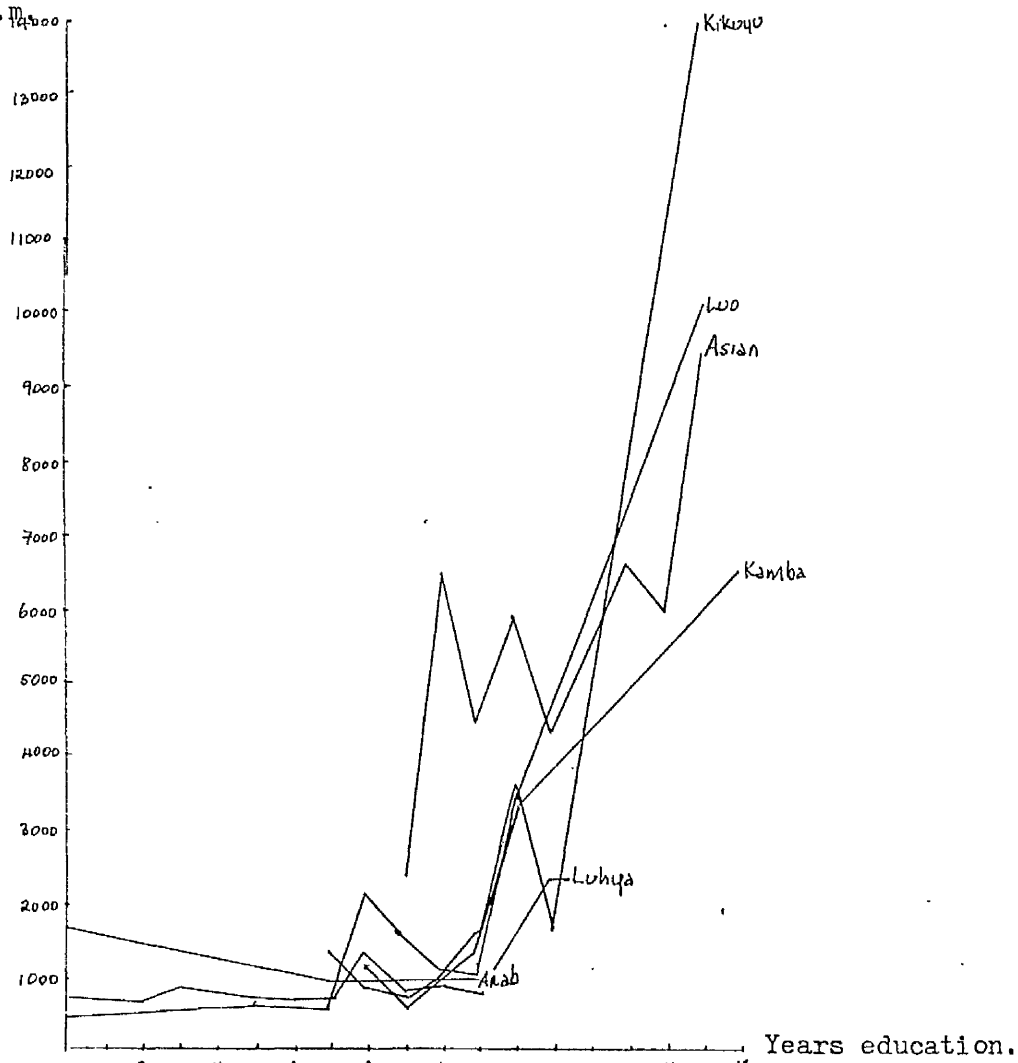
Mean income by education achieved, Respondent's occupation = white-collar

Salary
p.m.
Sh.



Mean Income by Education Achieved, Father's Occupation = Blue-collar

Salary p.m.
(KSh.)



Mean income by education achieved, Father's occupation = white-collar

APPENDIX E

Mean Private Expenditures
Per Pupil by Province and Tribe: KSh. per month

Tribe	Province			(N)
	Central	Coast	Nyanza	
Kikuyu	193.0	133.0	51.7	(514)
Luo	-	42.8	43.6	(782)
Arab	-	51.4	46.4	(568)
Kamba	99.0	49.7	51.0	(27)
Luhya	-	47.6	55.5	(47)

Source: Schooling Survey, 1979-1980

Mean values of Selected variables by
Ethnic origin of Pupils.

	Tribe..				
	Kikuyu	Luo	Mijikenda	Kamba	Luhya
Household size	7.9	8.7	10.1	8.0	7.9
Landsize	3.2	6.1	5.9	3.8	7.3
No. Siblings	4.6	6.0	5.5	5.3	6.4
Expend. Primary school (Ksh p.m.)	92.4	43.6	51.3	49.7	55.0
CPE Score					
Male	185.1	179.9	158.4	150.7	187.1
Female	167.1	157.4	136.5	135.2	163.8

Source: Schooling Survey, 1979-1980

Table F.1: Regression coefficients, dependent variable log salary. (All coeffs. sig at 95% level)

	KIKUYU	LWO	CONSTAL	ASIAN	KANEA	LURIA
R ²	.654	.695	.754	.806	.673	.642
CONSTANT	6.10	6.30	6.73	5.18	6.47	6.30
Years of schooling ²	.696	-.143				
Years of schooling		.410				
no school						
5-6 yrs school						
7 yrs school						
8-10 yrs school						
11 yrs school						
12-13 yrs school						
14 yrs & over						
Exam secondary Div I	.693		1.22		.894	
Div II	.466	.395			.220	
Div III	.147					
GCE						
Fail	-.330					
high: 3 passes						
2 passes	-.657	.746			1.28	.666
1 pass					2.19	
Years of experience ²	.669					
Years of experience	-.104		.496		.361	.301
EDUP: school x exper.						
Yrs. unemployment			-.162			
Age: 20-24 yrs						
25-29 yrs	.162					
30-34 yrs	.263					
35-39 yrs	.159					
40-44 yrs						
45-49 yrs						
50 yrs & over						
Age squared		-.579				
Sex:male	-.199					
Number of dependants						
Birth position						
Number of siblings	.159	-.241				
School type:						
primary: public						
private						
secondary: public			.394			
private						
harambee	-.166					
technical	-.209					
mission						
Mother's education		.826				
Father's occupation:						
None, casual, unskilled						
self-employed						
professional						
farmer						
Landsize: hectares	.316	.333	.459			
Employing firm: private	.303	.231	.426			
foreign	.390					
manufacturing						
Size: 5-19						
20-49						
50-99						
100-199						
200-499						

Table F.2: Standard errors of coefficients given in Table F.1

	KIKUYU	LWO	CONSTAL	ASIAN	KANEA	LURIA
Years of schooling ²	.304	.031				
Years of schooling		.296				
no school						
5-6 yrs school						
7 yrs school						
8-10 yrs school						
11 yrs school						
12-13 yrs school						
14 yrs & over						
Exam secondary Div I	.013	.012	.106	.067	.012	.015
Div II	.020					.127
Div III	.009					.054
GCE	.004					.030
Fail	.007	.032			.008	.013
high: 3 passes						.007
2 passes	.148					.008
1 pass	.070	.037	.290	.280	.008	.213
Years of experience ²			.047			
Years of experience						
Yrs.school x yrs exper.						
Yrs. unemployment						
Age: 20-24 yrs	.005	.031		.185	.008	.017
25-29 yrs	.012					
30-34 yrs	.004					
35-39 yrs						
40-44 yrs						
45-49 yrs						
50 yrs & over						
Age squared	.007			.041	.009	
Sex:male		.141				
Number of dependants		.010				
Birth position						
Number of siblings	.003			.091		
School type:						
primary: public						
private						
secondary: public	.003		.070			
private	.005					
harambee						
technical						
mission		.008				
Mother's education				.116		
Father's occupation:						
None, casual, unskilled				.027		
self-employed				.029		
professional		.008	.029			
farmer		.038				
Landsize: hectares	.004					.011
Employing firm: private	.011		.209		.050	.102
foreign	.003					.061
manufacturing		.038				.007
Size: 5-19		.008				.009
20-49						.008
50-99						
100-199						
200-499						

ASIANS
 MOBILITY FROM FATHER'S OCCUPATION TO RESPONDENT'S OCCUPATION IN 1980
 RATIOS OF OBSERVED FREQUENCIES TO FREQUENCIES EXPECTED ON THE ASSUMPTION OF INDEPENDENCE

Father's Occupation	Respondent's Occupation in 1980																							
	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	24	(N)		
Farmer	7.1	.	.	.	.	.	.	.	1	
Rural labour	5.5	.	.	.	.	.	.	.	.	2	
1. None	-	
2. Unskilled	4.5	.	.	.	.	.	.	.	.	.	1		
3. Mason, carpenter	-	
4. Driver	5.0	.	.	.	.	.	1		
5. Plumber	-	
6. Electrician	-	
7. Mechanic	4.5	.	.	.	.	.	.	.	.	.	2.7	1	
8. Machine operator	-	
9. Foremen, supervis.	5.0	.	.	.	.	.	1.8	1.4	.	4.0	.	.	.	0.9	4	
10. Self-employed	.	.	.	4.0	.	.	1.6	.	.	.	.	4.0	1.1	0.4	0.6	0.4	.	.	.	.	.	12	
11. Other-skilled	-	
12. Sales staff	4.5	.	.	.	.	.	.	.	.	.	1.2	1	
13. General clerk	1.0	1.2	2.4	0.6	.	.	.	.	.	.	9		
14. Typist, secretary	-	
15. Mid-management	5.6	.	.	.	.	.	3		
16. High-management	5.6	.	.	.	.	.	1		
17. Architect	4.5	.	.	.	.	.	.	.	.	.	1		
18. Para-medical	-	
19. Astronomy	5.6	.	.	.	.	.	.	-
20. Statistician	-	
24. Accountant	1.1	2.8	.	.	.	.	.	.	.	.	2.8	4	

* Excludes casual labour Source: Labour Force Survey 1980

LUHYA TRIBE
 MOBILITY FROM FATHER'S OCCUPATION TO RESPONDENT'S OCCUPATION IN 1980:
 RATIOS OF OBSERVED FREQUENCIES TO FREQUENCIES EXPECTED ON THE ASSUMPTION OF INDEPENDENCE

Father's Occupation	Respondent's Occupation in 1980																								(N)
	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	24				
Farmer	1.3	1.3	2.0	0.8	1.0	0.8	1.0	0.9	1.1	1.0	1.0	1.2	0.5										121		
Rural labour	0.7	0.5	0.7	0.7	1.1	1.1	1.6	1.1	1.1	4.0	4.0	1.5											26		
1. None	12.5	0.8						1.7				12.5											4		
2. Unskilled	1.5	0.8	1.0	1.8	2.0	0.7	1.0	1.1				1.2	1.5										37		
3. Mason, carpenter	0.8	1.1				2.6		2.2				1.2											11		
4. Driver	8.5	0.5	2.1	5.5			1.2			17.0			8.5										6		
5. Plumber																							-		
6. Electrician							2.1																1		
7. Mechanic												6.7											2		
8. Machine operator							2.1																1		
9. Foremen, supervis.	12.5	3.1					1.8					1.7											4		
10. Self-employed	2.5	1.0			0.8	5.0	0.8			11.0	1.4	2.5	10.0										19		
11. Other skilled												25.0	50.0										2		
12. Sales-staff																							-		
13. General clerk	0.4	1.6	2.2	2.2		2.6	1.9				1.7												8		
14. Typist, secretary																							-		
15. Mid-management													100.0										1		
16. High-management			3.1																				1		
17. Architect																							-		
18. Para-medical			2.1																				2		
19. Agronomy																							-		
20. Statistician																							-		
24. Accountant																							-		

1* denotes casual labour

Source: Labour Force Survey 1980

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