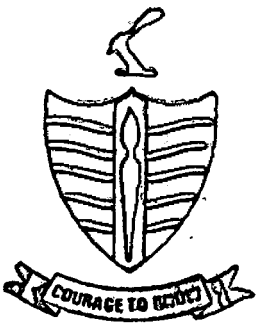

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Theoretical Model of Labour Force Participation

1. Introduction

There are many different approaches to the study of socio-economic behaviour. One is to view behaviour as what might be called individual decision making process. According to which, each behavioural decision such as labour force participation is made independently from all other decisions. The other approach is where one can view micro-economic behaviour as a household decision making process. The latter approach assumes that individual behavioural decisions are made interdependently. The argument is to study individual behaviour as a part of a larger behavioural framework which links the household's decisions through a process of simultaneous and recursive relations.

Both the above mentioned approaches have their relative merits in explaining economic behaviour. Recently it has been argued that individual behaviour involves household decision making and therefore it should be incorporated in economic models accordingly.[1]

The basic neoclassical model of labour supply shows that the labour supply curve could be either upward sloping or backward bending, depending on the relative strengths of the income and substitution effects. The simple labour supply model was developed for an individual facing a dual choice in terms of time allocation : work or leisure. The fact that non-market work and leisure constitute different uses of time has also been accounted for.[2] The model has since been extended to take into account the inter-relation of the use of time by different family members.[3] A further develop-

1. T. P. Schultz, "Fertility determinants : A theory, evidence and an application to policy Evaluation". Economic Journal 1973.

2. J. Mincer "Labour Force Participation of Married women" in Aspects of Labour Economics 1962.

3. Mainly by extending the list of independent variables explaining individual's labour supply.

ment considers the household as a unit of production with time and market goods as inputs and commodies as output.[4] Further extensions incorporate the 'production' of children in the family utility function.

For the labour supply response of a household, the behaviour of all the members comprising the household needs to be examined. At any given time the household members decide simultaneously how to allocate their time in market activity, leisure or home activity. An individual's decision about the allocation of his (or her) time is linked to the decisions of his household (and its social set up) to a far greater extent in Brazil than in the developed countries. Families in general and family heads in particular play an important role in the decisions of their family members.[5] In view of the above mentioned factors the study of labour force participation behaviour should relate to household units rather than individuals for Brazil.

The decisions of all members are interrelated as the welfare of the household is comprised of the welfare of its members. To some extent the home productivity by one can be substituted by the home productivity of the other. Following the maximisation principle the household members would specialise in the area of their comparative advantage. Along with the decision to allocate their time between market work or leisure, the household has many other objectives to satisfy (e.g. size of the family, the investment in education of the younger group, the savings for old age etc).

In a country like Brazil, with its long history of slavery the social and economic preferences are interrelated in such a way that the conventional ceterus-paribus technique for isolating the economic structure from the social can be quite misleading. The social structure operates as both a stimulus and a constraint on behaviour. The economic behaviour may be constrained by the importance of

4. G. S Pecker "A Theory of the allocation of time" The Economic Journal 1965 September.

5. For Brazil some studies on Labour force are available, none of them is based on micro data from the census (the data I hope to use). A list for reading on Brazilian Labour Force is attached at the end.

descent, kinship, marriage and other personal relationships. Such relationships are only partly given to the household, but they have to be built upon and maintained. Thus whatever the source and type of household's assets (including time) a considerable part is invested in maintaining and extending social ties. (Many times it can be observed that people leave vital economic tasks for seemingly unprofitable activities-the investment in social ties). Therefore an alternative view of the so-called 'uneconomic' or 'leisure' time is appropriate for every household. The choice before the household in the allocation of the available (all members) time is three dimensional, market work, leisure and social activity. In such an environment the labour force participation concept needs to be modified, since the distinction between 'work' and 'leisure' and therefore 'workers' and 'non-workers' becomes hazy. The time allocation becomes three dimensional, market work, economically motivated social activity and leisure.[6] Measurement of economically motivated social activity would present difficult problems, as it is an unobservable quantity, but its importance can not be ignored.[7] As all the aspects of time allocation are interrelated, for policy purposes it would be important to know what kind of activity responds to different socio-economic stimuli, the extent of such responses and possible effects In other words how are the different activities linked. Such an approach would be more useful for policy purposes than an examination of individual work-leisure choices. The social activity can either compete with or be complementary to the traditionally regarded productive activities. Moreover the rewards for economic effort may lie to a greater degree in the ability to fulfill social obligations and patterns of decisions are therefore regulated

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6. For females another dimension would be housework.

7. The interrelation of labour force activity incorporating socal activity in some way has been mentioned by some other recent studies. See "An Analysis of time allocation and labour force supply in rural sector of Melanesia" by G. Kirkpatrick in "Labour force participation in low income countries" Edited by G. Standing and G. Sheehan. (ILO 1978) and "Village Society and labour use" by B. Dasgupta. (ILO 1977)

accordingly.[8]

Now looking at the labour force participation behaviour, the household will seek to maximise its welfare function, which can be written as :

$$\max W = (u_1, u_2, u_3, \ldots\ldots, u_n)$$

u_i = Utility of each family member ($i = 1, 2, \ldots, n$)

Utility of each member is comprised of his earned income ($y = WH$, where W = real wage rate, H = maximum hours of work), leisure consumed (L), and returns from indulging into social activity (E). Each member tries to maximise u, so the problem is

$$\max \; u = u(y, L, E)$$

Differentiating with respect to H

$$u_y W + u_L(-1) + u_E(-1) = 0$$

$$W = \frac{u_L}{u_y} + \frac{u_E}{u_y}$$

or

$$u_y W = u_L + u_E$$

i.e. marginal benefit of work equal to marginal cost due to L and E foregone. The preceding equation gives a relation between hours of work and wage rate i.e. it represents the supply curve. The shape of the curve will depend on the strengths of substitution and income effect.

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8. The relationship between social structure and economy is not one way. Opportunities for technical change may provide the impetus for social change, though this can be ignored for a cross-section analysis of labour force participation.

Now if we allow the individual to have some unearned income Y as well as his wages, then his full income can be written as :[9]

$$FI = WH + Y$$

Then the supply curve obtained from utility maximization would be

$$H = H(W, \underline{Y}, \underline{E})$$

Where signs refer to partial derivatives. Now if W rises, the total effect on hours can, by Slutsky decomposition be represented as :

$$\underset{?}{\frac{\partial H}{\partial W}} = \underset{+}{\left(\frac{\partial H}{\partial W}\right)_u} + H\left(\frac{\partial H}{\partial Y} + \underset{-}{\frac{\partial H}{\partial E}}\right)$$

If W rises the worker's income effect would reduce his hours of work (assuming L and E normal).

For simplicity intra-household effects have been omitted. Time allocation both for individual members and the household will depend on (a) the relative productivities and wage rates of household members in the market and non-market work. (b) On the possibilities for substitution among activities and members. Thus the distribution of time by each member as well as among members of the household is influenced not only by tastes and biological social and cultural specialisation of functions but by relative prices which are specific to individual members of the household. The hours of work supplied in the market by the household is the sum of hours worked by all its members.

$$H_H = \sum_{i=1}^{n} H_i \qquad (i = 1, 2, \ldots n)$$

Here I would assume that the household follows the principle of sequential maximization. It is assumed that the decision of the

9. The importance of the "Full income" concept (Becker) is that its magnitude is independent of the time the household chooses to allocate to income earning activities-it is the ultimate standard of opportunity cost of time.

household head is 'exogeneous' for the members. That is, the participation and hours decision of the head of the household is not effected by the decisions of the other members decisions.

The interdependency in the decision making of household members can be analysed with the help of *path analysis*. Path analysis is concerned with linear, additive, asymmetric relationships among a set of variables which are conceived as being measurable. As statistical technique, path analysis does not add anything to conventional regression technique applied recursively to generate a system of equations. However as a pattern for interpretation, path analysis is invaluable in making explicit the rationale for a set of regression equations. Any causal interpretation of statistical data must rest on assumptions-assumptions about ordering of variables, about residuals etc. When underlying assumption of a model are made explicit the discussion necessarily has to be consistent. Another useful contribution of path analysis is that it provides a calculus for indirect effects (which play important role in household decision making) when the basic equations are expanded.

In this system the hours of work by wife and children are represented as being dependent on husband's hours of work and other features of the household. As said earlier the economically motivated social activity is hard to measure, it's influence in the system is represented by two variables, socio-economic background (SEB) and size of the family (D). The F variable is included to catch the effects of labour force participation on fertility. The justification for its inclusion is that the hypothesis that households consider children as an alternative form of investment (and consumption) next to other forms of accumulating assets. The interdependency of the relationship is diagrammatically represented in figure 1.

The diagram represents interactions in the decisions of household members, the direct and indirect effects. Decisions about hours of work of a member is determined by wages, the unearned income of the household and the returns from investment in social ties. The household will behave so as to equate the marginal utility from various activities. Wages are assumed to be exogeneously determined for the household members.

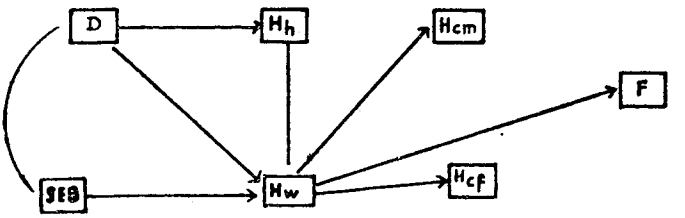

Figure 1 Causal model for Household decisions regarding hours of work.

D = Number of dependents, SEB = socio-economic background, H_h = hours worked by the husband (or household head), H_w = hours worked by the wife, H_{cm} = hours worked by male child (aged[w] 10+), H_{cf} = hours worked by female child (age 10+)[10], F = fertility (children less than 5 years old).

The two variables assumed to represent the effect of preferences and economically motivated social activity are D and SEB. F is included to see how the working of mothers effect fertility.

In figure 1 straight lines with arrows at one end represent the dependence of endogeneous variables upon other endogeneous or predetermined variables, curved lines represent correlation between exogeneous variables. No assumption is made about the source of the correlation between the SEB and D.[11] The relationships represented in figure 1 can be written as a system of recursive equations.

$$H_h = f(D, W_h, Y_h) \quad \cdots \quad (1)$$

$$H_W = f(D, SEB, W_w, Y_w)^{12} \quad \cdots \quad (2)$$

10. Male child and female child's hours of work are treated separately as the traditional attitude of the household and society to their working are very different in Brazil. For example in a household with a better SEB female children are not usually expected to take part in the labour force.

11. Here the disturbances in the system have been ignored. Disturbances can be assumed to be uncorrelated with each other, or some inter-correlation (where a residual is correlated with variables entecendent to it, but not to immediately after it) can be assumed.

$$H_{cm} = f(H_h, H_w, W_{cm}, Y_{cm}) \quad \cdots \quad (3)$$

$$H_{cf} = f(H_h, H_w, W_{cf}, Y_{cf}) \quad \cdots \quad (4)$$

$$F = f(H_w, Y_H) \quad \cdots \quad (5)$$

W = the wage rate of the respective member (exogeneous), shown by the subscript. Y = unearned income of the members, Y_h = unearned income of the household.

1. 1. Decomposition of the Variables :

Many of the variables considered in the above formulation are composite and it is of interest to compute the relative contributions of the components to different endogeneous variables which will also help to ascertain how causes affecting the composite variables are transmitted via the respective components. The variables shown in figure 1 and (1) to (5) equations can be further decomposed into various parts as shown in figure 2.

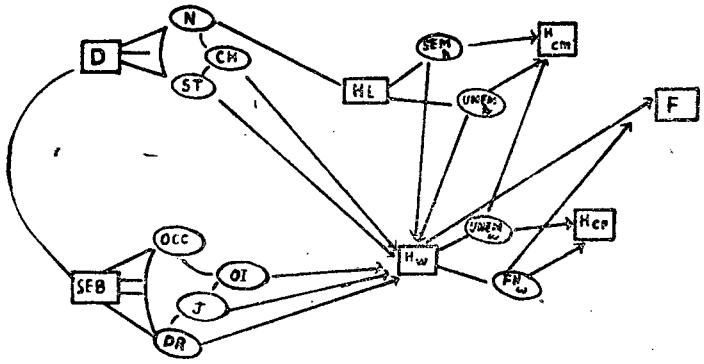

Figure 2

N = Number of dependents,
CH = children less than 5 years of age,
ST = number of students,
OCC = occupational scale for the head,
OI = other income or assets, J = joint family or not, DR = duration of residence, SEM_h = head self employed, $UNEM_h$ = head unemployed, $UNEM_w$ = wife unemployed, FH_w = wife family helper.

12, The effect of children's participation on mother's hours of work can also be incorporated in equation (2) by including H_{cm} and H_{cf} as predetermined.

The variables are represented in boxes and their respective components in circles. The components considered are the ones used in traditional labour force analysis, which can be estimated and tested for their significance and expected signs.

Most of the variables are self explanatory, but some need further clarification. ST = number of students in the family are specifically included to represent the need for extra income (as education is not completely free in Brazil). In socio-economic background J = joint family system and DR = duration of residence are included to cacth the effect of traditionalism (particularly for female participation). Duration of residency also represent the preference for participation as most of the internal migration is motivated by economic opportunity and also the assets of migrants are low (hence encourage participation). Moreover the less the duration of residency, the less would the household be involved in social activity. The variable $UNEM_h$ = unemployed family head, is expected to catch the 'added' worker effect. Though there is no direct way of assessing the income and substitution effects from the model, variables for wages and other income could serve as rough guides. The variables used also lend themselves very easily for policy implications.[13]

Incorporating the information shown in fig. 2, the equations (1) to (5) can be rewritten as followes

$$H_h = f(N, W_h, Y_h) \quad \ldots \quad (6)$$

$$H_w = f(W_w, SEM_h, UNEM_h, CH, ST, CI, J) \quad \ldots \quad (7)$$

$$H_{cm} = f(W_{cm}, SEM_h, UNEM_h, UNEM_w, Y_{cm}) \quad \ldots \quad (8)$$

$$H_{cf} = f(W_{cf}, UNEM_w, FH_w, Y_{cf}) \quad \ldots \quad (9)$$

$$F = f(H_w, FH_w, Y_H) \quad \ldots \quad (10)$$

One way of establishing the importance of various components would be to do an unconstrained estimation (i.e. estimating equation (1) to (5) with the respective variables) and study the patterns of coefficients. Then do a constrained estimation using equations (6) to (10) and

13. For example if DR significant in increasing participation, measures to facilitate labour mobility will increase participation.

compare the results. One important feature of the households which has not been incorporated in the system is whether it is a 'Rural' or 'Urban' household. The reason is that in view of the divergencies in rural and urban households, in my opinion it would be better to split the sample and analyse the behaviour of rural and urban households separately. Another useful way in which the sample can be split would be to analyse the behaviour of 'Joint households' and 'Nuclear households'.

2. Labour Force Participation Decision[1]

For the study of labour supply, it is important to distinguish between the decisions of the household members to participate in the labour force and the hours they are prepared to work.[2] Incorporating the participation decision becomes particularly important when considering the behaviour of the members who generally comprise the secondary labour force (wife and children above the age of 14 in a household).

The theoretical model developed in the last section is appropriate only if the utility maximisation process has an internal solution i.e. if $H_i \neq O$ (if all time is not spent in enjoying leisure or indulging into social activity). Although the condition of interior solution in the process of utility maximisation is generally acceptable for the head of the household (or any other prime aged male (34+) family member, who are generally in the labour force), it is questionable when other household member's behaviour in the labour market is under consideration. In the sequential model it was assumed that the decision of the head of the household regarding participation is exogenous, while the decisions of other household members are greatly influenced by the head's decision and general household conditions.

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1. It is assumed throughout the analysis that work does not carry any utility. Without this assumption one needs to adjust the value of time for the marginal disutility of work. Johnson B (1966) and Gronau R (1970),

2. Hill C R (1973) has pointed out that participation rates overestimate the labour supply, while hours of work underestimate labour supply responses for the poor. Hall R E (1973) has shown that estimating the labour supply by multiplying separate estimates of participation rate and hours worked suffers from statistical bias.

In a developing country participation decision of the part of wife or female children could be more important than the hours decision, due to the strong traditional attitudes and rigid social set up. Recognition of the fact that many aspects of the social and economic behaviour involve choice among discrete alternatives or decisions has recently led to a considerable development of statistical models appropriate to the analysis of such 'quantal response' problems in cross-section data.[3] Moreover the importance of combining the participation decisions with the actual hours worked in the labour market has been recognized in most labour studies.[4] Mincer tried to rationalise this problem by proposing that the decision period of the household members is the "lifetime" and the actual timing of hours worked during the lifetime is dependent on random factors (responsible for individual differences with the same market and non-market characteristics) at any given time. Adopting this approach for individual data a dummy dependent variable is used (either O or 1) and for aggregate cross-section data the participation rate of the sample is used. In fact the latter has been the method used by most labour force studies prior to 1975.[5]

A more recent approach developed by Gronau and Heckman involves directly estimating the indifference curves, hours of work and participation decision. It explicitly estimates the shadow price of time to overcome the problem of discontinuity in the labour supply function in the case of unemployed labour force. Heckman (1974, p. 680) points out that "working with shadow price functions, it is possible to characterize both interior and corner solutions within a common theoretical framework because the shadow price functions are defined at corners where demand functions are not defined."[6] From the utility maximisation conditions the shadow price of each

3. See McFadden D (1976) for a survey of development in quantal choice analysis.

4. Bowen W G and Finegan T A (1969), Cain G G (1966) and (1967), Gronau R (1973), Heckmen J (1974), Mincer J (1962), Layard R, Frederking M and Zabalza A (1978).

5. Mincer (1962), Cain (1966, 67), Powen and Finegan (1969), Cohen, Rea Jr and Ierman (1970), Ashenfelter and Heckman (1974) etc.

6. The analysis used here is based on the simple formulation put forward by Mincer and Becker and latter developed by Gronau, Heckman and Schultz.

member's time is the ratio of the marginal utility of non-market time to the marginal utility of income from work. (page 3)

$$\text{or } U_{Li} + U_{Ei} = W^*_{i,\,H} \qquad (2.1)$$

Where the subscript H indicates the number of hours worked at which the shadow wage is evaluated.[7] W^* = shadow wage rate, U_{Li} = utility from liesure, U_{Ei} = utility from social activity. Using the well known maxim of utility analysis (i.e. MU of a commodity is equal to its market price if any amount of it is bought and is less than it's market price if none of it is bought), we can write the participation decision in the following manner.

$$W_i < W^*_{i,\,0} \qquad \text{for non-participants}$$

$$W_i \geqslant W^*_{i,\,0} \qquad \text{for participants}$$

If the ith member of the household is working, the number of hours will be adjusted so that in equilibrium

$$W^*_{i,\,H} = W_i \qquad (2.2)$$

Now we can look at the maximisation conditions of the household in terms of the shadow wage function for each member, the arguments of the functions being the same variables that enter the equations defined in (1.1) to (1.5) and (1.6) to (1.10). For the ith member of the household shadow wage is

$$W^*_i = f(H_i,\ Y_i,\ E_i,\ )^8 \qquad (2.3)$$

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7. Shadow wage here is analogous to 'reservation wage' in search models. Pissarides C (1976).

8. If a Z_i vector to accourd for personal characteristics is included then (2.3) beeomes

$$W^*_i = f(H_i\ ,\ Y_i\ ,\ E_i\ ,\ Z_i\ )$$

Y_i = unearned income of ith member

H_i = Hours worked by the ith member

E_i = Returns from indulging into social activity

With shadow wage function it is possible to represent the decision of labour force participation in terms of a binary variable R_i.

$$R_i = 1 \qquad \text{if } H_i > 0 \qquad (2.4)$$

$$R_i = 0 \qquad \text{if } H_i = 0$$

Using (2.2) to (2.4) we can define a transformation γ (.) so that

$$R_i = \left[W_i - W^*_{i,0} \right] = 1 \text{ if } W_i - W^*_{i,0} > 0 \qquad (2.5)$$
$$= 0 \text{ ,, ,, ,, } < 0$$

W_i is the market wage for the ith member of the household, and $W^*_{i,0}$ is the shadow wage at zero hours of work.[9] In decisions of participation hours of work play the role of a slack variable and the assumption is that all members are free to choose their working hours.

So far the market wage rate (w) for every member has been considered as parametrically determined. This involves problems ; (a) The market wage rate for the members who are not working but are in the labour force can not be observed. (b) The observed market wage rates may exhibit transitory elements. To avoid these problems an 'offered' or 'imputed' wage function is usually used in the empirical estimation of labour supply functions. The market wage or offered wage is assumed to depend on observable variables (like education and experience) and unobservable variables (like chance, social

9. From now on the subscript is dropped in the analysis to simplify.

contacts in the right places etc). The market wage is expected to increase with education and years of labour force experience. The hours of the participants adjust to equate the market wage rate and shadow wage, while the shadow price of non-working members exceeds their potential wage rate and it increases with family income.

The rate of labour force participation would depend on the joint distribution of shadow wage rate (W*) and market wage rate (W). Formally let f (W,W*) be the joint density function then participation equals.

$$\begin{aligned} Pr &= \text{Prob. } (W > W^*) \\ &= \int_{-\infty}^{\infty} \int_{W^*}^{\infty} f'(W, W^*)\, dW\, dW^* \end{aligned} \tag{2.6}$$

For estimation of f (W, W*) we need to know the truncated wage distribution g (W/W > W*) and the portion this distribution constitutes of the total market wage distribution i.e. the participation probability. As we do not have any information regarding the distribution of W*, we need to make certain assumptions. The usual assumption is that W and W* are independently distributed and that their joint distribution is bivariate normal.[10]

3. Estimation

As mentioned earlier market wage W is assumed to depend on education and labour market experience and the shadow wage rate W* on unearned income and returns from social activity. Assuming the linear semi logarithmic form and denoting a vector X for observable variables determining W and a vector M denoting observable variables to determine W*, we have

$$\ln (W) = \underline{X}' \underline{\alpha} + e \tag{3.1}$$

$$\ln (W^*) = \underline{M}' \underline{\beta} + u \tag{3.2}$$

10. Here the independence assumption is clearly questionable as it assorts that none of the factors determining W affects W and vice versa.

Combining (2.5), (3.1) and (3.2)

$$R = \phi \left[\underline{\acute{F}}\,\underline{\gamma} - v \right] \qquad (3.3)$$

where $\underline{\acute{F}}\,\underline{\gamma} = \left[\underline{\acute{X}}\,\underline{\alpha} - \underline{\acute{M}}\,\underline{\beta} \right]$ and $v = e - u$

The probability that a household member participates in the labour market P (H > 0) is

$$P(H > 0) = P(R = 1) = P(\underline{\acute{F}}\,\underline{\gamma} > v) \qquad (3.4)$$

An obvious problem is that W* is unobservable. If W* could be observed and if all variables in X and M were exogenous or predetermined, we can estimate α and β using ordinary least squares, assuming independency of the error term.

To estimate the offered wage W and shadow W* we need to specify their functional form and associated stochastic structure (i.e. X, M, and v). Assuming X is comprised of A denoting experience (present age minus school leaving age) and S representing education (years of schooling). Similarly if M can be decomposed into H (hours worked), Y (unearned income) and E (returns from social activity) then equations (3.1) and (3 2) can be rewritten as

$$\ln(W) = b_0 + b_1 A + b_2 S + e \qquad (3.5)$$

$$\ln(W^*) = \beta_0 + \beta_1 H + \beta_2 Y + \beta_3 E + u \qquad (3.6)$$

It is assumed that e and u have joint normal distribution, each with zero mean but correlation between them is allowed. Disturbances are assumed to be uncorrelated with the regressors.

If for any member of the household ln (W) > ln (W*) at zero hours of work then

$$b_0 - \beta_0 + b_1 A + b_2 S - \beta_2 Y - \beta_3 E > e - u \qquad (3.7)$$

and hours of work adjust so that W* = W then (3.5) and 3.6) become

a recursive system determining hours worked, and the particular adjustment of hours depends on the magnitude of the discrepancy e — u.

If (3.7) holds then reduced form equations for hours worked and market wage rate are

$$H = \frac{1}{\beta_1}\left(b_0 + \beta_0 + b_1 S + b_2 A - \beta_2 Y - \beta_3 E \right) + \frac{u - e}{\beta_1} \qquad (3.8)$$

$$\ln (W) = b_0 + b_1 S + b_2 A + u \qquad (3.9)$$

Equation (3.3) and 3.9) give us the hours worked by a household member and his wage rate only if (3.7) holds. The distributions of the disturbances of hours and wage equations are conditional distributions (conditional on (3.7). Since same exogenous variables appear in (3.7) to 3.9) the mean and variance of these conditional distributions, for a particular member of the household depend on the values of exogenous variable. Therefore it is not possible to obtain unbiased or consistent estimates of equations (3.7) to (3.9) using least squares since regressor are correlated with the disturbances.

However it is possible to obtain consistent parameter estimates, using the relationship betwecn conditional and unconditional distributions, i.e. the joint distribution of observed hours and market wages.

$$j (H, \ln (W), W^* < W)_{H = 0} = \frac{m (H, \ln(W))}{Pr \left((W > W^*)_{H = 0} \right)} \qquad (3.10)$$

Where m (H, ln(W)) is the unconditional distribution, Pr $\left[(W > W^*)_{H = 0}\right]$ is the conditional probability and j (.) is the conditional distribution, Since it was assumed that e and u are jointly normally distributed, m(.) is of multivariate normal density and Pr(.) is a univariate cumulative normal density function with many of the parameters common with m(.).[1] If a household with T

1. For the proof of these statements see Heckman (1974) Appendix 2 pp 692.

total members contains K who work and T-K who do not work, the likelihood function for the members (T) may be written as

$$L = \prod_{i=1}^{K} j \left((H_i, \ln (W_i)/W_i > W_i^*)_{H=0} \right) \times \Pr \left((W > W_i^*)_{H=0} \right) \times \prod_{i=K+1}^{K} \Pr \left((W_i < W_i^*)_{H=0} \right) \quad \ldots (3.11)$$

Using (3.10) the likelihood function in 3.11) becomes

$$L = \prod_{i=1}^{K} m \left[H_i \ln (W_i), \right] \prod_{i=K+1}^{T} \Pr \left[(W_i < W_i^*)_{h=0} \right] \quad (3.12)$$

Maximizing this likelihood function with respect to thc parameters of the model, iucluding the variances and covariances of the disturbauces e and u in (3.1) and (3.2) yields consistent, asymptotically unbiased and efficient parameter estimates.

In a household where all members are working $T = K$ and maximizing(3.12)would be equivalent to the full information maximum likelihood method (FIML), but if $K > T$[2] FIML will not be maximum likelihood method with its desirable properties as long as any parameter affects both the distributions governing the work decision $\Pr \left[(W_i > W_i^*)_{H=0} \right]$ and the hours decision $m(H_i, \ln(W_i))$.

For identification assume that the last variable in $\underline{X}$ (the vector $\underline{X} = x_1, x_2, \ldots, x_k$ does not appear in $\underline{M}$, the rest of the variables $(X_1 = x_1, x_2, \ldots, x_{k-1})$ are contained in $\underline{M}$. And some variables in $\underline{M}$ (an array called $\underline{M}_2$) are not contained in $\underline{X}$, then (3.1), (3.2) and (3.4) ean be rewritten as

2. Which is true for an average household in developing economy.

$$\ln (W) = X_1' a + a_2 x_k + e \tag{3.13}$$

$$\ln (W^*) = X_1' \beta_1 + M_2' \beta_2 + u \tag{3.14}$$

$$\Pr (F' \gamma > v) = \Pr \left[(\alpha_2 x_k + X_1' (a_1 - \beta_1) - M_2) \beta_2) > v \right] \tag{3.15}$$

If v is normally distributed the equation (3.13) could be estimated using least squares. Probit analysis can then be used in (3.15) and γ estimated up to a factor of proportionality $= 1/\sigma$ (where $\sigma^2 = E(v^2)$) as the estimation procedure uses the standardised cummulative normal distribution formulation.

$$\Pr (R = 1) = \Pr (F' \gamma > v) = \int_{-\infty}^{F' \gamma/\sigma} \frac{1}{2\sqrt{\pi}} . e^{-t^2/2} \, dt$$

$$= \int_{-\infty}^{a_2 x_k + X_1' (a_1 - \beta_1) - M_2' \beta_2 .} \frac{1}{2\sqrt{\pi}} . e^{-t^2/2} \, dt \tag{3.16}$$

From the coefficient of x_k in (3.13) and (3.14) we can determine σ, and using σ we get $(\alpha_1 - \beta_1)$ and β_2 and finally using the estimates of a, in (3.12) β_1 can be determined.

4. The Logit/Probit Model of Estimation

In the labour force participation literature, the use of logit/probit methods for estimation has become common particularly for the analysis relating to the secondary labour force.[1] Prior to the use of logit/probit method, the estimation of linear probability function with a dummy dependent variable with least squares presented three main difficulties.[2] Firstly it violated the condition that estimated probabilities should be constrained to 0, 1 interval. Secondly least squares

3. Heckman J and Wills R (1977), Peter Peek (1978), Guy Standing (1978) layard R, Frederking M rnd Zabalza A (1978).

2. This was the approach used in Bowen and Finegan (1969), Cohen Rea Jr Lerman (1970) and Boskin (1973).

estimators produced inefficient estimators due to the heteroseedastic structure of the errors. And finally the inconsistancy in the estimates of standard errors of least squares parameters led to inaccurate test.[3]

With the use of logit/probit methods their functional form guarantees that the estimated probabilities lie in 0, 1 interval and the maximum likelihood methods of estimation has the desired properties of assymptotic efficiency and consistancy.[4] The probit specification is based on the multivariate normal distribution allowing nonzero covariance terms, while the logit formulation rests on the univariate independent extreme value distribution. Both independent probit and logit models have similar properties, both assume independence and after normalizing the variances the distributions that form the basis of the models — independent normal and extreme value respectively — are quite similar (logit analysis in many cases is preferred due to computational simplicity, a distinct advantage). Logit analysis replaces the standardised cummulative normal distribution by the standardised cumulative logistic distribution, therefore (3.16) can be written as

$$\Pr(H > 0) = \Pr(R = 1) = \Pr(F'\gamma > v)$$

$$= \left(1 + e^{-F'\gamma(\pi/\sigma\sqrt{3})}\right)^{-1} \qquad (4.1)$$

The identification conditions remain unchanged.

A further extension of probit analysis proposed by Tobin (1958) represents a halfway dichotomous situation where one can analyse the question whether a family member participates in labour market, and also how much time is spent in the labour market i.e. participation and hours worked can be estimated simultaneously using both the information on hours supplied by participants and the information about those,individuals who are looking for work. The dependent variable is constrained to be either positive or zero. The approach is based on a specification where the dependent variable (the time spent in the labour market) is equated to a linear combination of

3. Bowen and Finegan Appendix 1.
4. Gronau and Heckman.

explanatory variables with unknown coefficients plus a normally distributed disturbance term.

If we have expected hours of work ($\hat{H}$) as a function of X (observable variables) and e representing the unobservable variables then $\hat{H} = \underline{X}' \underline{\alpha} + e$. With P(.) as the cumulative distribution function of e the likelihood that a household member is not participating is $\Pr(\hat{H} + e < 0) = F(-\hat{H})$. The likelihood that individual is participating is $\Pr(\hat{H} + e = H) = f(H - \hat{H})$. Thus if in a household with T members, I are non-participants and K participants the likelihood of observing positive or zero hours of work is

$$L = \prod_{i=1}^{I} F(-\hat{H}) \prod_{K=1}^{K} f(H-\hat{H}) \qquad (4.2)$$

$$= \prod_{i=1}^{I} F(-X'a) \prod_{K=1}^{K} f(H - X'a)$$

The estimates of obtained by maximizing this likelihood function are unbiased and consistent.

5. The Conditional Probit Model for choices among alternatives

In the sequential model of labour force participation, the head of the household is assumed to be in the labour market. The other members can allocate their time working, enjoying leisure or indulging into social activity (an extra choice for the wife would be housework and for the youth the decision to continue their studies). The maltivariate logit and probit analysis are the most widely used for estimating the relationship between choices among alternatives. In multiple alternative situations a generalization of logic analysis called conditional logic is used. Daniel McFadden has developed qualitative choice models based on the conditional logic specification to a high degree of sophistication.[1] The main disadvantage of the

1. McFadden D (1973), Nerlove M and Press S J (1973, 1976). The logistic model of Nerlove and Press has been used by Ribeiro De Clieveira (Unpublished Ph. D dissertation 1978) to analyse the joint decision of labour force participation and enrollment at school.

functional form providing the basis of conditional logit is the property of "independence of irrelevant alternatives". Hausman and Wise (1978) have proposed a method not constrained by the "independence" restriction and it allows for a much richer range of human behaviour than the conditional logit approach. Their method makes explicit allowance for variation in tastes across individuals for the attributes of alternatives and across alternatives for the individuals. (As the main argument in developing the sequential model of participation was the interdependence of decision among household members and among different alternatives, the conditional probit analysis is most appropriate to analyse the choice decision among alternatives).

The analysis in this section is comprised of a simplified version of Hausman and Wise model. The problem considered is as follows. An individual faced with J alternatives chooses one of them, then the probability that he chooses the jth alternative is P_j where $\sum_{j=1}^{J} P_j = 1$. If the outcome is represented by a vector $\underline{Y} = (y_1, y_2, \ldots, y_j)$ where y_j is either zero or one and $\sum_{i=1}^{J} y_i = 1$, then the probability that j_1 is chooser is given by the probability that $\underline{Y} = (1, 0, \ldots\ldots, 0)$ where the probability of any y is given by $p_1^{y_1} p_2^{y_2} \ldots p_j^{y_j}$. For N identical individuals indexed by i the likelihood function is as follows.

$$L = \prod_{i=1}^{N} P_1^{y_1} , P_2^{y_2} , \ldots\ldots , P_j^{y_j} \qquad (5.1)$$

Given a random sample the unknown parameters are estimated by maximum likelihood. A sample may be thought of as N independent drawings from a multinomial distribution with log likelihood fuuction.

$$L = \sum_{i=1}^{N} \sum_{j=1}^{J} y_{ij} \ln P_{ij} \qquad (5.2)$$

Both the probit and logit likelihood have this same general form but different specifications of the probabilities p_{ij}. The conditional

logit specification is based on the assemption that errors are independently and identically distributed with extreme value density function. For example assuming that the value of the three alternatives to the ith individual can be represented by

$$U\ (X_1\ ,\ a_i\ ) = \bar{U}_{i1} + e_{i1} \tag{5.5}$$

$$U\ (X_2\ ,\ a_i\ ) = \bar{U}_{i2} + e_{i2} \tag{5.4}$$

$$U\ (X_3\ ,\ a_i\ ) = \bar{U}_{i3} + e_{i3} \tag{5.5}$$

From these three alternatives the probability that the first is choosen according to conditional logit is given by

$$P_1 = \left(1 + e^{U_2 - U_1} + e^{U_3 - U_1} \right)^{-1} \tag{5.6}$$

In the conditional probit the problem is not only to find the values of p_j that maximises (5.2), but also to allow the selection probabilities to be dependent on attributes of the alternatives in the choice set and on the attributes of the individual making the choice. If the probability that ith individual chooses the jth alternative is $P_{ij} = P(\underline{X}_{i1}, \underline{X}_{i2}, \ldots, \underline{X}_{ij}\ ;\ \underline{a}_i)$ where $\underline{X}_{ij}$ is a vector of attributes of the jth alternative and $\underline{a}_i$ is a vector of characteristics of the ith individual, conditional probit analysis differs from conditional logit analysis in the stochastic specification of the probabilities P_{ij}. The probit specification is based on the multivariate normal distribution with non-zero covariance terms while the logit formulation rests on the univariate independent extreme value distribution.

With the conditional probit the probability that the first alternative is choosen is given by

$$P_1 = \int_{-\infty}^{\bar{U}_{12}/\sqrt{\sigma_1^2 + \sigma_2^2 - 2\sigma_{12}}} \int_{-\infty}^{\bar{U}_{13}/\sqrt{\sigma_1^2 + \sigma_2^2 - 2\sigma_{13}}} b_1\ (\eta_{21}\ ,\ \eta_{31}\ ;\ r_1\ )\ d_{21}\ d_{31} \tag{5.7}$$

where b_1 is standardised normal distribution with corelation coefficient $\eta_{jj'} = e_j - e_{j'}$ (errors from different alternatives)

$$r_1 = \left(\sigma_1^2 - \sigma_{13} - \sigma_{12} + \sigma_{23}\right) / \sqrt{\left(\sigma_1^2 + \sigma_2^2 \sigma 12\right)\left(\sigma_1^2 + \sigma_3^2 - 2\sigma_{13}\right)}$$

The conditional probit model allows corelation among the random components of individual valuations of alternatives, thus relaxing the "independence of irrelevant alternatives" constraint (the primary limitation of logit model). Moreover probit model makes explicit allowance for heterogeneous preferences among decision makers.[2]

In the sequential model of labour participation, it would be interesting to see how young members of the household choose among the alternatives of studying or working and for the married females of working or staying at home, using the conditional probit model.

6. Sample Selection Bias

Throughout the analysis the question of sample selection bias which results from the exclusion of those not working in the 'market wage equation' ln (W) has been ignored. Take for example the variable education in ln (W), if education has positive effect on the participation (due to its positive effect on market wages) then among the participants a disproportionally high number of more educated will be observed, biasing down the estimated coefficient of education on market wage rate. Moreover due to selectivity biases some variables which are not important for 'market wage' may appear as significant if only those working are included. If number of children is included in the 'market wage' function (as a proxy for lack of labour market experience) for mothers among the explanatory variables and its

2. If in (5.3) to (5.5) we specify the value of alternative as

$$U(X_{ij}) = \bar{\beta}_1 X_{1ij} + \bar{\beta}_2 X_{2ij} + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_{ij}$$

then

$$U = \bar{\beta}_1 X_{1ij} + \bar{\beta}_2 X_{2i} \text{ and } e(X_{ij}, a) = \beta_1 X_{1ij} + \beta_2 X_{2ij} + \epsilon_{ij}$$

Var (e_{ij}), and cov (e_{ij}, e'_{ij}) would give the individual taste parameters.

coefficient is negative and significant, then it can't be taken as evidence of discrimination against women with children or that women with less market experience earn less. In fact the variable number of children might just be portraying the sample selection effect i.e. that women with more children tend to participate less in the labour market.

The arguments of the last paragraph can be formalised as follows. If all market wages (including the wages of those out of work) could be observed, the market wage equation would be $E(\ln W/X)=X'a$ which can be estimated by ordinary least squares. However wages in the market can only be observed for those who are working, the sub-sample for estimation is

$$E(\ln W/X)=X'a+E(e/v > -F'\gamma) \tag{6.1}$$

As v and e are not independent (e is a component of v according to (3.3), therefore $E(e/v > -F'\gamma) \neq 0$. Moreover as the variable in X form part of F we can't assume that the conditional mean of e is uncorrelated with a i.e. least squares estimates will yield biased results.

Assuming a bivariate normal distribution for v and e, the conditional mean of the error term in (6.1) is[1]

$$E(e/v > F'\gamma)=\frac{\sigma_{e,v}}{\sigma_0}\,\theta(D) \tag{6.2}$$

where $\theta=\dfrac{\psi(D)}{1-\lambda(D)}$ and $D=\dfrac{F'\gamma}{\sigma}$

The density and the distribution function of the normal distribution are given by ψ and λ respectively, Therefore $\theta(D)$ is the ratio of the ordinate to the tail area of this distribution and is a monotonic non-linear function of D.

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1. Johnson and Kotz (1972), Gronau (1974), Lewis (1974) and Heckman (1977).

From (6.2) the market wage function (6.1) can be written as

$$\ln (W) = X' a + \frac{\sigma_{\epsilon, V}}{\sigma_v} . \theta (D) + d \qquad (6.3)$$

The expression in (6.3) shows that the question of sample selection bias "may be reformulated as an ordinary omitted explanatory variable problem" (Heckman 1977).

The sample selection effect on γ is captured by (D) in (6.3) and if we know D, ln(W) can be estimated by least squares. As D is unknown its estimate D has to be used which is obtained from probit analysis, only maximum likelihood methods will give consistency and efficient estimates of D (and therefore θ (T). Heckmer has shown that least estimates (i.e. the sample selection bias is not serious particularly with big samples like the one to be used for empirical testing of the sequential model).

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Strategy of Education in a Developing Country
A Case Study of Cuba and Kenya

Human resource development is an important factor determining, affecting and contributing to the economic development of a country. Although mentioned by economists since Adam Smith, this factor has been emphasized by economists after mid-fifties of present century. However, the emphasize has been on the effects of investment in human capital as related with earnings, unemployment and choice of occupation. Human resource development as related to education, health and nutrition are fields still to be explored analytically and intensively.

The importance of human resource development needs no argument. As pointed out by Theodore W. Schultz that "more than three-fourths of the income of a modern economy is attributed to the contributions of human agents, and hence fourth or less to natural and other material forms of capital, it should be obvious that the formation and utilization of human capital is of major economic importance[1]".

Human resource development is the base of human capital which is an important and integral part of capital, considered as essential for economic development as blood for human body. Human resource development is of immense importance for developing countries because they have abundance of human resources and shortage of physical capital.

Education and training is a key factor for human resource development and building up human capital in a society. Education is source of useful skills and knowledge acquired by people and forms a capital

1. Theodore W. Schultz, "Human Capital: Policy Issues and Research opportunities", Human Resources, Columbia University Press New York, 1972, p. 9.

which is in substantial part of deliberate investment and leads to economic benefits in the form of higher productivity. Therefore, education has been considered as not only an important indicator of economic development but also as an important factor for economic development. Education is in its right perspective, when viewed, not only a social investment but also an economic investment. Lack of engineers, technicians, managers and low standards of education are social as well as economic obstacles to development. Unemployment of highly educated people can not be considered as a social problem only. It is an economic problem and problems as such need to be solved by changes in the economic framework of a country.

As education has been recognized as an important factor and indicator of economic development, there has been a rapid and steady expansion of education in developing countries which has resulted in many "socio-economic" problems and this has been referred as educational explosion or educational dilemma in these countries.

The extent of rapid educational expansion in developing countries is indicated by the rate of growth of enrollments at different levels of education in such countries during 1960-66. "In developing countries as a whole enrolement growth rates were 42% at the primary level (reflecting an earlier start), 80% at the secondary level and 93% at the higher (mostly university level). In absolute terms this growth added nearly 55 million primary students, 15 million secondary students and 2 million students in higher education, or an average of 12 million additional students each year. One result of these increases was to achieve in 1968 primary and secondary enrollement ratios, respectively, of 40% and 15% in Africa, 55% and 33% in Asia, and 75% and 33% in Latin America.

The two basic reasons for this rapid expansion of education and high rate of enrollements in developing countries are :

(a) Increasing demand of education by people as it is considered essential for improving the economic condition of an individual as well as country and.

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2. IBRD, Education : Sector Working paper, IBRD office, Washington, September, 1971, p. 6.

(b) growth of population and, more particularly, the relatively recent increase of population in the developing countries which has resulted in an extraordinarily high proportion of young people.

Most of the governments of developing countries have invested their previous limited resourses on the expansion of education and have not gained the expected benefits from this huge investment.

Educational expansion has not only led to deterioration in educational standards but also to many socio-economic problems directly or indirectly. Urbanization, mass unemployment of educated and technical young people, students' strickes, gap between thinking of young and old generation and other similar social and economic problems are related to the education in one way or other. But the most serious problem has been the growing unemployment among educated young in urban areas of developing countries. Education by producing mass of unemployed, frustrated, disillusioned and disgruntled young people, has proved its irrelevance to the socio-economic requirements of developing countries. As indicated by world Bank that "with hardly 10% of the age group in secondary schools and less than 1% in universities, some education systems are already approaching the point of producing graduates in numbers exceeding the effective demand of employers."[3]

The problem will be more acute and serious by 1980 as almost all the developing countries will be trying to fulfill a public commitment to achieve universal primary education by not latter than 1980. Unemployement of educated young people is more an economic problem than a social problem. Huge investment in education go waste because the production of investment is young people who are not contributing to the production of society. Schultz has rightly pointed out that "educational capital deteriorates when it is kept idle. Thus, unemployment impairs the skills and associated knowledge that a worker has acquired. Physical capital as a rule also deteriorates when it stands idle. But there is a difference, e.g., a fleet of freighters can be placed in "mothballs" for years : a corps of scientists obviously can not. The consequences of changes in the level of employment also reach into the

3. Ibid., p. 9.

class room : they may adversely affect the signals that guide the formation of educational capital."[4]

The nature of the problem is not only complex but also multidimensional and closely related with the economic structure of the whole society. The recent literature on the topic is an indication of that. Moreover, as the seriousness of the problem has been realized by most of the developing countries, they are trying to reorient their educational and training system with greater emphasize on building educational structure compatable with their economic requirements and solving the problem of unemployement. Different policies and strategies have been adopted in different countries for solving the dilemma. Basically such policies and strategies can be categorized into two in broad perspective :

(a) Changes in educational structure keeping the socio-economic structure of a country as it is and.

(b) Changes in the economic structure and educational structure are considered together and taking place side by side.

China, Cuba and other socialistic countries are following the second strategy while other developing countries are adopting the first one.

An attempt has been made in this paper to analyse these two strategies taking the case of Kenya for the first and Cuba for the second. Detailed analysis of the educational structure and related problems has been made for Cuba before the revolutionary government came in power and changes in the structure of education for the afterward period. Similar analysis has been made for Kenya. Comparison of two different strategies has been made in a broader sense. Conclusions have been drawn in both cases separately and for the conclusions on whole one can read both conclusions together. The purpose of the paper has been to analyse the policies adopted in education as related to economic development in particular aspect of employment which is the most serious problem of developing countries at present

4. Theodore W. Schultz, Ibid., p, 34.

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CUBA—A CASE STUDY

Developmental experience of Cuba since 1959 is of important significance for developing countries trying to achieve social justice human dignity, economic prosperity and getting rid of man's exploitation by man.

"Revolutionary Cuba has some significant accomplishments to its credit. Unemployment, perhaps the most serious problem to be faced in most of the nations of Latin America, Africa and Asia in the decade of 1970's, has been eliminated in its overt (though not its covert) from since 1959. A highly equitable distribution of real income has been achieved, in contrast to the situation in most low and high income countries of the world, Communist and Western alike. A very equitable medical delivery system has been constructed and universal free education assures access unrestricted by income."[5]

The achievements of Cuban "revolutionary government" and the policies adopted during this period are to be studied analytically and intensively by the planners and policy-makers of under-developed countries which are facing the problem of unemployment, hunger and miseries of all sorts.

The economic structure of Cuba before revolutionary government was based on wrong foundations and economy, inspite of all reforms within that structure : was in very bad shape. The economic and political conditions in Cuba before revolution has been described by Dahlman very briefly and precisely as that "in summary, then, Cuba in 1958 was a splintered and bankrupt society, monopolistic and dependent economy inhibited its economic growth and led stagnation and unemployement. The uneven distribution of income could be seen clearly in the urban-rural income differentials and in the high percentage of illiteracy and under-education in population. The political system had not worked. Attempts at non-revolutionary change had failed. The country was in the hands of a repressive dictatorship."[6]

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5. Archibald. M. Ritter, "The Economic Development of Revolutionary Cuba : Strategy and Performance", Praeger Publishers New York, 1974, p. 1.

6. Carl J. Dahlman, "The Nation-Wide Learning System of Cuba," Research Program in Eco. Development, Woodrow Wilson School, Princeton University, Princeton, New Jersey, 1973, p. 25.

The educational system of Cuba was inefficient administratively, not according to the socio-economic needs of the country, having access to only urban areas and rich class, and producing discontended, frustrated young people with no aims in life and unemployed, before the revolutionary government came in power.

Education Before Revolution :

After the end of Spanish rule in Cuba in 1898, United States policy makers tried to improve the educational situation in Cuba by emphasizing on public primary schooling as the main goal. Local boards for education were created, teacher training institutes were established, new text-books and curricula was introduced and new school laws called for compulsory school attendance.

In 1958, there were 12 schools for training teachers with almost 8,000 students. There were 7 home-making schools with slightly over 1,000 students by 1957-58. The number of business schools for training accountants and clerical employees was 18 in 1957-58 and the number of students was 9,500. There were 21 Institutes of Secondary Education in 1958. In the area of Vocational Education, there were four types of schools. The first, Called schools of Arts and Trades, numbering 12, with about 3,800 students in 1957-58. There were 3 Technical Industrial Schools, the second type of vocational schools, and the number of students enrolled was 1,700 in 1957-58. The third type was Polytechnical or middle level schools, numbering as 5 and students enrolled were 5,600 in 1957-58. The fourth type was of small agricultural schools in each of six provinces under the Ministry of Agriculture. There was a total of six Universities with an enrollment of 25,514 in 1958.[7]

These statistical figures as mostly used as an indicator of improvement, shows that United States policy makers were successful in achieving their objective of educational improvement in Cuba. But as noted by Rollan G. Paulston that "in quantitative term, the U. S. contribution was impressive. Thousands of public schools were built, and school enrollment, mostly urban, increased by three times the pre-independence peak-still, less than one half of all school age children

7. Ibid., pp. 6—8.

attended classes and most left before attaining literacy. In the United States, the American policy of seeking a democratic government through literacy was criticized as being both naive and unrealistic. It was suggested, instead, the Cuban really needed practical education designed to help them adapt to their rural environment."[8] Jolly is the view that the picture of cuban education in 1959 was pretty much the same as before.9

The educational system at the very first instance provides the access to education only to a limited population as is obvious from the enrollment figures.

Most Cuban children did not complete the eight years of schooling which were obligatory because some families could not even afford the clothing and books necessary to send children to school. The opportunity cost of their foregone work while in school was too high for the families who were already living below subsistence level. Moreover, there were not enough public schools to accomodate all of the school age population.

The next important problem under such educational system was the gross inequalities between public and private schools. "It is evident from the figures of enrollment, which inereased four times between 1939 and 1958 in private primary schools as compared to an increase of 70 percent enrollment at public schools during this period."[10]

The main reason of expansion of private schools as compared to public schools, was the deteriorating educational standards and inadequate facilities of education at public schools. The poor people of Cuba could not afford sending their children to private schools and public schools were providing poor education both in quality and quantity.

Educational facilities in rural sector were not only quantitatively

8. Rolland G. Paulston as quoted by Carl J. Dahlman, Ibid., p. 6.

9. Richard Jolly, Part II : Education, in Dudley Seers et al., Cuba The Economic and Social Revolution, University of North Carolina Press, Durham, N. C. 1964, p. p. 164-165.

10. Rolland Paulston as quoted by Carl J Dahlman, Ibid., p. 13.

poor but were also qualitatively poor as compared to the urban sector. The enrollment in relation to the estimated population between age of 5-13 years was 50.7 per cent for whole Cuba, 64.8 per cent for the urban sector and 33.9 per cent for rural sector in 1950."[11]

Educational system was administratively inefficient and contrary to the Socio-economic needs of Cuba. It was just providing students with education not usefull in practical life and producing young people alienated from society, intellectually poor and narrow minded, with no incentive and initiative to work, lacking potentialities to face and solve the problems faced by the nation.

The educational system's emphasis was on turning out white-collered students instead of technicians and students who could serve in agriculture and industry. In 1952, 19 per cent of turn-outs were lawyers and arts graduates. Only one per cent related to agriculture and just 2,500 engineers to serve the industry."

Although many efforts were made to improve the educational facilities within the required structure of a capitalist society, it did not improve. As pointed out by Jolly that "many of old weaknesses of educational system persisted. In 1955-1956, 20 per cent of the educational budget was still absorbed by the central administration. In the same year, technical and vocational education received less than 4 per cent of the educational budget and school enrollment did not keep pace with population growth. In the area of adult education the Cuba Ministry of education reported in 1952, that it had organized a national campaign against illiteracy, with support from associations representing civic institutions, societies and corporations in every school district. The financial allocation to all adult education was 52,10,000 or 2.5 per cent of educational budget. This sum may be measured against 1,032,849 Cuban persons aged 10 or over registered as illiterates during the Census of the following January. These further reasons make it difficult to believe that the improvement of the fifties were either sufficiently deep or sufficiently widespread to make great changes in the educational structure of Cuba revealed by National census of

11. IBRD, "Report on Cuba, 1950. p. 405.
12. Richard Jolly, Ibid., table 2, p. 169.

1953. The population remained widely ill-educated or illiterate. The schools remained largely inadequate and inefficient."[13]

The figures quoted and the preceding discussion about the educational system of Cuba is not only a brief summary of what was happening but is also an indicator that the reforms within the existing structure did not help in improving but it did deepen class division and socio-economic problems in Cuba.

Before discussing the educational strategy after revolution in Cuba, it is essential to know the views of revolutionary government and its leader Fidel Castro about education and its relationship with economic and social structure of the society. Without understanding the basic philosophy behind the educational strategy followed in Cuba, it will not be possible to understand the educational structure of Cuba in right perspective and its causes of achievements.

Role of Education :

The function of education for the revolutionary government of Cuba area : Consumption, investment and ideology.

Castro in his speech in 1953 observed that education has failed to fulfill the needs of the people, both because of its inadequate content and unequal distribution. He declared that their new government would undertake an integral reform of the educational system to bring it into line with the egalitarian ends of the revolution and the manpower needs of development in a rural economy."[14]

The revolutionary government of Cuba considered education as a basic right of every human being and considered education as a free of cost comsumption item available to all in a society.

The function of education as investment is based on the basic philosophy of a socialistic system that workers are the owners of the means of production and are the producers of the wealth of society.

13. Ibid., p. p. 173-174.

14. For the main text of the speech "History will Absolve Me" as it has come to be known, see Paul E. Sigbund, ed., The Ideologies of Developing Nations, p. p. 307-13, quoted in Carl J. Dahlman, Ibid., p. 26.

So they must learn the scientific methods of production in agriculture and industry. The relationship between socialism, the technical revolution and education as considered by the revolutionary government are obvious from remarks of Castro that no social revolution can lead to socialism without a technical revolution – nor can communism be reached through abundance. It can be reached only through education and abundance. Abundance can not be achieved without the massive education of the pepole so that they master this technology."[15]

The revolutionary government of Cuba emphasis on education is mainly because of its ideological function. However, in addition to the more strictly political or doctrinaire orientation, education was also given the more difficult and important task of creating the consciousness of the "New Man"——the ultimate goal of the revolution. As early as 1963 Castro said, "Communism is equal to material bases plus education. Abundance by itself will not make a better human being, abundance equally distributed among all without exploitation, plus education is what makes a superior human being."[16]

Overview of Educational System After Revolution :

As the whole political, economic and social structure was being transformed into a socialistic structure, the educational system was also reorganized as a whole keeping in view the function of the education as discussed before. The changes and reorganization of educational structure can be divided into two main broad categories :

1. Formal Educational Structure.

2. Non-Formal Educational Structure which can be called as the parallel Educational System"

Formal Education :

The formal education system is divided into four stages, excluding

15. Castro, quoted in Cuba Ministry of Education, Report to XXXI International Conference of Public Education, convoked by OIE and UNESCO. 1968, p. 177, as quoted by Carl J. Dahlman op. cit., p 31.

16. Fidel Castro, quoted in Raul Ferrer, "avanceade la education obrey Campesina en Cuba", Cuba Socialista, no III, No. 23 (july, 1963), p. 28 as quoted by Ibid., p. 33.

education pre-primary forjod for children who have reached the age of five and an extensive system of day-care centres children, as :

(a) Primary Education.

(b) Basic Secondary (four years).

(c) Pre-University and Middle Level Technological and Professional Education (3 years) and.

(d) University Education (varying length).

(a) **Primary Education :**

Nearly 50 per cent of children of primary school-age were not attending any school before revolutionary government started changes in educational structure. In one year between 1958 and 1959, there was an increase of 3,000 schools and increase in number of teachers by more than 7,000. The most of these schools were established in the country side. The number of students increased by over 370,000 in the first year after revolution and the enrollment was more than double in countryside.

In 1961 the government nationalized all private schools and education was free for all and with uniform educational standard and facilities. Double session in elementary schools were started. The number of school days was increased. In primary education, keeping in view the principle that education should be combined with productive work of social utility, three types of work were developed : educational work, productive work, and work for social utility.

The idea of combining work and study was developed further in 1966, children devoted 50 per cent of the time to study, 30 per cent to sports activities, physical education and recreation, by establishing special boarding schools where free boarding, food and clothes education, medical care and recreation activities are provided to children

The usefulness of the principle of combining work and study at all levels can be indicated that in 1972 there were schools where the fourth and sixth grades worked two hours a day and the food which

was produced on their school plots was more than enough for their boarding schools and surplus was sent to workers' dining halls. In urban areas the students assemble toys and package pharmaceutical product.

(b) **Basic Secondary :**

Three years of common junior secondary stage has been introduced instead of two years of upper primary in the old system. The most important is of curricula constantly in view to have more emphasis on science and more coordination of courses with productive work. Students go to co-operatives, forms and participate in carrying out different tasks of agricultural production. In the beginning of 1966 a plan called "the school goes to the countryside" was started on experimental basis-20,000 students of the province coming from the basic secondary level along with their teachers, went out to do work in the rural areas. Productive work in agriculture and school work was done side by side with cultural activities, sports and recreation. As the experiment was successful, it was implemented on a national scale in 1966/1967. The benefits of the program are : the ideological and moral development of youth ; an understanding of the agricultural problems of the country ; a new relationship between student and teacher and between both of them and agricultural workers ; the development of the collectivist tendencies and self-government which are important for the creation of new society ; and an important contribution to the development of the economy.

The students participation in the countryside does not interrupt their education and evaluation but as the revolutionary government felt that the activities of the program are not integrated into the formal school program as conceived, "the school in the country-side" plan was introduced in 1970. By the end of the 1972, there were nearly 50 schools of this type. Each of these boarding school has a capacity of 500 students and includes ; dormitories for teachers, staff and students ; class rooms, laboratories, workshops, meeting rooms, a library, a barber shop, an infirmary, a movie theatre, a school store and more recently plans for swimming pool.

The government is expanding this system of education and objective is to build up such schools for all basic secondary school students.

Pre-University and Middle Level Technological and Professional Education

Enrollment in pre-University and middle level technological institutions has not increased and there have been a lot of fluctuations. The kind of technological education available now is better in quality and varied in nature as compared to such facilities before revolution. The technological education before revolution was neglected and teaching was only in a limited number of skills not according to the requirements of society. The new curricula emphasis is on all-round training of the student so that he is master of the skill and can solve the problems of his profession.

The government is fully aware of the importance of technical education and problems related to it. Castro in one of his speeches pointing out the problem said :

"I do not mean to downgrade any other activity, but just take an example languages.... of course this is in the field of education. There are 24,033 people studying language. That is fine. We should be glad that so many people realize the importance of studying foreign languages. That is a part of education and could be even be considered a positive index. One thing I ask myself though, is why there are only 7,757 studying agriculture and 16,203 in our industrial institutes. And I ask you who is going to produce material goods in the future and how ? How will we be able to introduce technology in agriculture and industry ? Who will work, and how, in the production of goods ? Furthermore, he pointed out that even when students get a technical education, many times they can not do anything practical because they have only received intellectual education."[17]

The solution which Cubans have for this problem is to combine work and study at the technological institutes too. The plan as to construct polytechnic institutes right next to it. In the future plans are to build senior high schools either in the country-side or in a factory.

University Education : Before revolution, there were three government and four private universities and most of the students

17. Fidel Castro speech to the YCL 1972, pp. 3-4 as quoted by Carl J. Dahlman, Op. Cit., P. 86.

were in law liberal arts and education. The number of students in engineering and sciences was very low. Most of the students getting university education were from upper classes because a majority of students could not afford expenses of university education. Between 1961 and 1962 university education was reorganized. All the universities were merged into three : one for western part of the island (University of Havana) one for eastern part (University of Orient) and one for the central part (Las Villas). The entrollment of students after revolution declined but after 1966 it was above the pre-revolutionary level. There have been major shifts in enrollment by area of specialization. The number of students in technology, agriculture, sciences and medicine have increased from 3,323 to 6918, 1202 to 3179, 1617 to 8,934, 3.947 to 8773 respectively during 1958 to 1970. But the number of students for humanities, economics and education decreased from 4.291 to 1597, 6102 to 837 and 5032 to 4812 respectively during this period.

These figures are an indicator for Cuba's changing strategy for development. "The very high increase in enrollments in technology reflects Cuba's emphasis on industrial development, increased in enrollments of agricultural sciences reflects emphasis on agriculture and fluctuating enrollments in education reflect the changing strategies for teacher preparation. In 1966 a period of two years was made compulsory for all graduates. Under the recent drive to universalize higher education, all University students work 20 hours a week in work related to their careers of study and an almost equal number of workers study at Universities. The main objective of the program is to "make every student a worker and every worker a student", in order to extend higher education to all people. Castro said in this respect that "the final solution is not one of creating more Universities, but rather of converting the whole country into a University. The industrial, agricultural and educational centres will be shops where students carry out production and research, guided by professors who will provide them with the necessary theoretical knowledge. And it is here where the contradiction between study and work is resolved in a higher synthesis of economic and educational development, because productive activities, productive processes, constitute the material base, the laboratory, where, in the future, all workers

18. Ibid., p. 89.

will receive their higher education".[12]

2. *Non-Formal Education*: Cuban revolutionary government emphasis on non-formal education has been very great and it has organized an entire system of education parallel to but outside regular school system. We will discuss briefly the various program launched by the government under this system and their basic philosophy and affects on the whole structure of society.

a. The Literacy Campaign : As the facilities of education before revolution were limited to urban areas and to rich class, there were about one million persons illiterate and revolutionary government wanted to educate them. In 1960 Castro announced at the United Nations that Cuba was going to eliminate illiteracy in a year. The literacy campaign started on January 1, 1961 and lasted untill December 1961. Of the 985,000 illiterate located, 894,000 enrolled in classes and 707,212 were made literate. This in one year literacy was reduced from 21 per cent of the population over age 14 to a mere 3.9 per cent. The teaching force was either adults who volunteered to teach on average of two hours each day during their spare time or were young student volunteers recruited from schools and teachers. As the whole society was mobilized, and volunteers were dedicated, Cuba achieved in one year what other countries have not been able to achieve in one year. This literacy campaign not only fulfilled the objective of teaching illiterate, but also provided opportunity to people from different social classes and background to learn from each other and obtain a better understanding of themselves, the causes of the revolution, and its goals.

Follow-up Course and Adult Education : Before the end of literacy campaign government had made plans to provide follow-up education for both the new literates and the under-educated. The programm started in 1962 with enrollment of 300,000 but by the end of August in 1962, it was almost 590,000. In 1962 the government also started a program, "The Battle for the Sixth Grade" with the objective to enable 500,000 workers to complete their primary schooling who had only a third grade education. In 1963 the worker-peasant faculties were created with the objective to prepare the students, workers and

19. Fidel Castro quoted in Cuba, MINED, Report to the XXXII Conference pp. 65-67 asquoted by Carl J. Dahlman, Ibid., pp. 92-93.

peasants who had completed a secondary education for University education in science and technology, which was becoming increasingly important for the development of industrial and agricultural plans of the country. In order to harmonize education with production, the schoolcalenders of worker-peasant education are adjusted according to the months not included in the sugar or other harvest seasons. A special program of adult education for women was started in 1961 in four different ways : evening schools for the improvements of domestics, employer schools, the "Ana Betan-Court" schools for peasant women, and special courses by the Cuban women's Federation. A vast follow-up reading program has also been started. Under this program every two months Ministry of education publishes 50,000 copies of the magazine (The pleasure of Reading) which is distributed free. A small encyclopedia containning articles on agriculture, revolutionary themes, geography and history, national literature etc published in 1967.

"Thus, the adult education program which began with the literacy campaign and proceeded with the development of follow-up courses has grown scope and objectives. Now it amounts to a whole informal school system which reaches beyond the walls of the traditional classrooms to the population at large." [20]

Worker Training and the Concept of Universalization : "The basic philosophy behind the Cuban educational system, the bond between education and work, led to the formal schooling programs participation in practical work experience on one hand, on other hand it has been considered important to intellectualize the workers. So the achievement has been intellectualization of workers and proletarization of education. The programms for intellectualizing workers comes under the concept of the "Universalization" of higher education. Such programms include as : Minimum Technical Program (The Minimo Tecnico Program) ; Technical and professional Education and the six by six program and Guided Industrial Studies. In future the training of workers, technicians and engineers is not to be accomplished only at the Universities and other formal institutions. "Castro pointed out in several speeches that there is no better base material of study to create specialized engineers and technicians than in the industries themselves, since they have all sorts of advanced

20. Ibid., p. 55.

equipments and numerous technicians who could devote part of their time to teaching.[21]

Dilemmas of Cuban Edudational System: Afer analyzing the Cuban educational structure before revolution and after revolution and accomplishments of present educational structure and policies, it is essential to know for policy makers and planners of other developing countries the problems and dilemmas of the existing educational system.

With the limited resources available, every government has to choose between different strategies. For Cuban revolutionary government in education sector, they have either to invest on expansion of education on low levels and mass education or on higher levels of education and more advanced specialized education. The government decided on mass education inspite of the fact that Cuba was facing the problem of shortage of highly educated manpower. Here is conflict between economic and idealogical goals which are emphasized by every revolutionary government.

The other important dilemma is how far Cuba has been able to accomplish its goal of a "New Man" who is more selflessly devoted to the community and needs of country than his own personal needs. This dilemma has been pointed out by Elizabeth Sutherland that "the revolution seemed to expect new men with creative non-conformist mentality to emerge from an educational experience that was not non-conformist.[22]

Another important problem is that how much should be invested in education. Education not only involves the direct cost but also an opportunity cost of manpower involved in education. One has to make cost-benefit analysis of every project and plan being implemented. But here is again the problem of preference. Idealogical returns may be given more importance than economic returns is a dilemma for all revolutionary governments to be faced.

Conclusions: The accomplishments of the Cuban educational system and economy as a whole are not only worthy appreciating but

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21. Ibid., pp. 64-65.

22. Elizabeth Sutherland, The Youngest Revolution, quoted in Paulston, "Education," Op. Cit., p. 393, quoted in Carl J. Dahlman, Ibid., p, 128.

it is also important for developing countries which are facing the same problems to follow the similar policies and strategies. But again when learning and following Cuban policies developing countries have not to follow blindly as has already happened by following the developed countries. Developing countries have to learn from the shortcomings of the system. And Cuban themselves had made critical analyses of the problems of the Cuban education system many times. "The most serious problems are discussed openly by the leadership implies that the Cubans are genuively concerned about the educational system and are very serious about making it successful," [23] Because they believe as pointed out by Fidel Castro that "we will make revolution if we really win the battle of education." [24]

Kenya—A Case Study

Kenya became an independent country on December 12, 1963. Keyna covers 225,000 square miles (582, 6000 square kilometers) with population of 9.9 million as estimated in 1967 which is increasing at the rate of 3 per cent a year.

Kenya's economy is predominantly agriculture. It is predominantly agriculture. It is estimated that agriculture provides livelihood of more than 75 per cent of population and contributes 35% of gross domestic product (GDP). The industrial structure is comparatively broader in Kenya as compared with other countries of East Africa. Most of the export commodities are agricultural and industry is also based on agriculture. The manufacturing sector and gross domestic product of Kenya although with a lot of fluctuations are growing at a steady rate. Kenya as all other developing country is facing the problem of unemployement, expansion of urban areas and various socio-economic problems related to it.

According to International Monetary Fund (IMF) survey, total labour force (male and female) probably exceeds 3 million. Some 0.8 million are estimated to be employed for wages or self-employed, a larger but undetermined number are on small farms and rest are either unemployed or underemployed. Kenya's unemployement is being aggrevated by its high population growth rate (3 per cent) which adds

23. Ibid., p. 131.

24. Fidel Castro, quoted in Education, Ano I. No 3, October-December 1971, p. 5 as quoted Ibid., p. 130.

some 25,000 persons annually to the total labour force."[25]

Kenya as other developing countries is facing the problem which the proccess of economic develoyment, resulting from the policies adopted during the last decade by these countries, has thrusted upon these countries. International aid and private foreign investment as pointed out by ILD survey has been "limited and its benefits have often been undercut and in some respect outweighed by the unhelpful influences accompanying them——biases in technology, restrictions in export markets and worsening terms of trade, strings to aid and transfer payments abroad."

Education :

Educational expansion in Kenya has been fast and the statistical figures regarding establishments of schools and enrollments are impressive but the problems rekated to it are frustrating. We will also discuss here in the same way as for Cuba, the educational system of Kenya in two categories :

(a) Formal Education and

(b) Non-Formal Education.

(a) **Formal Education :**

Formal education in Kenya is expanding very fastly at all levels of education. One of the indicator of this educational expansion is the tremendous increase in school enrollments. It increased by over 60 per cent—from about 900,000 in 1963 to 1.5 million in 1970.

Secondary school enrollments rose more than four fold, from 3000,000 in 1963 to almost 130,000 in 1970. The proportion in secondary school enrollment went up from a base of 40 per cent in 1963 to 90 per cent in 1970. The number of enrollments at the tertiary level has also increased very rapidly.

The underlying principle in Kenya's formal education has been expanding education through "self-help efforts and local government".

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25. IMF, "Surveys of African Economies, Volume 2 : Kenya, Tanzania, Uganda and Somalia, IMF, Washington, D. C., 1969, pp. 137-209.

26. ILO, "Employment, Income and Equality : A Strategy For Increasing Productive Employment in Kenya", ILO office, Geneva, 1972, p. 2.

Government has been successful in this respect as is indicated by the enrollments in unaided secondary schools (mainly Harambee Schools) which accounted for 40 per cent of total secndary school enrollments. Although the underlying philosophy behind encouraging unaided schools is worth appreciating but such policy has led to many educational problems.

The first problem in this respect has been that actual enrollment in schools has far exceeded them the planned enrollment targets which has created many planning problems. Teacher training is the most important and obvious in this respect. Teacher has been trained according to enrollments projected in the plan. Shortage of trained teachers has led to unaided secondary schools employing untrained teachers. Trained teachers are mainly employed in Govt. aided schools. This has created a wide gap in standard of education between government and the unaided schools.

The educational facilities in unaided schools are not according to the increasing enrollments of students. The deteriorating standard education in non-government schools as compared to government school is indicated by rate of success of candidates in Kenya Junior Secondary Examination. In 1967 for example, the rate of success for government schools was 55 per cent, where as it was 35 per cent for Hambee schools and 25 per cent by other private schools. In 1970, close to 65 per cent of candidates from aided schools passed the school certificate examination, compared with less than 30 per cent of these from unaided schools. The other serious problem of educational structure as adopted by Kenya is the examination and selection system. "The certificate of primary education is almost exclusively designed for selection of secondary schools and ignores the needs of the majority of pupils who will continue their education beyond the primary level. The effect of the certificate of primary education on the curriculum of primary schools is to strengthen the tendency to gear the entire primary schooling of young people to entering secondary education, instead of preparing them for available employment opportunities, especially in the rural areas and in the informal sector."[27]

The problems of drop-outs and unsuccessful candidates in selection and examinations is very serious. On one hand such young people

27. Ibid., p. 22.

are frustrated because of their educational failures and on other hand they do not get employment. One can imagine what social problems can emerge in a society which is building up an army of such frustrated youths.

The formal education provided the existing system does not prepare students for employment opportunities available in the society. The educational expansion and structure of education as such not preparing students for employment opportunities has created an immense problem in Kenya.

"As education expanded fast, amang a population itself fast expanding thousands of young Kenyas, with their parents and other supporters, are beginning to find their certificates almost worthless, at least for obtaining jobs. First, it was the primary school leavers, then from 2 leavers, now those with school certificates, soon those with university arts degrees. This is the background to frustration among school leavers and their families."[28]

The other aspect of such formal education is preparing students not for technical jobs or goals in agriculture, rural sector. But for white collered jobs in urban areas. Students after having such education, waste their time and energies in wandering on the beautiful roads of big towns or big offices working as clerks instead of working in industries or in rural sector. The survey of ILD points out that "the problem of youth employment does not lie so much in the number of primary school leavers : it lies much more in the whole philosophy of education, which mentally prepares the pupils for formal, non-rural employment in the context of an economy which has failed to generate enough employment opportunities of this sort : and in the foresceable future this will continue to be so, unless there are fundamental changes-both inside the school and outside."[29]

Looking at the problem of educated youth in the context of the economic situation in Kenya, one has to conclude that the need for changes are not required only within the educational system but also in the structure of the economy. In rural areas of Kenya, people do not have land and facilities to obtain a reasonable income. Less than 12

28. Ibid., p. 2.

29. Ibid., p. 237.

per cent of land is suitable for crop production in the present state of technology. Majority of the families living on small holdings earn no more than 60 a year. Some of the poor small holders benefit from remittances from relatives in towns."[30]

No employment opportunities in rural areas and educational expansion has led to the problem of influx of educated youth in urban areas.

Expansion of urban towns with not rapidly increasing job opportunities to absorb all young educated people has on one hand led to accept these people jobs which keep them on subsistence level in city like Nairobi and on other hand has created many social problems. As pointed out by ILD survey : "For those who can not make a living in the rural areas, or fulfill their aspirations there, there is an alternative of migrating to the towns. Particularly among the younger and better educated (these two categories tend to coincide), there is a greate influx to the towns, where both the formal and informal sector of the economy offer income-earning opportunities. This influx has resulted in very rapid growth of the urban population, particularly of its African component. Moreover, the influx and the resulting demographic growth are increasingly concentrated in the single city of Nairobi."[31]

Most of the developing countries like Kenya are adopting non-formal education as an alternative approach to education, without changing the socio-economic structure of society. The emphasis in non-formal education has been training people with education in polytechnic institutes which emphasise on providing training in craft skills, agricultural knowledge, small scale business management and general economic understanding. Without structural changes in the whole socio-economic set up of a society, how such alternatives lead to intensify the problem of unemployment and ill-education can be illustrated from what has happened in Kenya.

(b) **Non-Formal Education :**

There are many programms which have been launched in area of non-formal education by government and private organizations after Kenya's independence. We can categorize them as following.

30. Ibid., p. 10.

31. Ibid., p. 10.

(i) Vocational Training Programs for Education and Drop-outs Youth,

(ii) Training Programs for Adult Populations in Rural Areas and

(iii) Multi-Purpose Training Programs.

(iv) Vocational and Other Training Programs for Non-Educated Population.

(i) Vocational Training Programs for Educated and Drops-Outs Youth :

In this category, we can see three types of programs launched in Kenya (1) Industrial and vocational training, pre-employment programs such as : (a) Young Christian Women Association (YCWA) training programs for girls and.

(b) Christian Industrial training Center-Nairobi. Young Christian Women Association (YCWA) training program has three different centres designed to train girls and women for employment. Each year the YCWA receives more than 1,000 applications from all over Kenya but places are quite limited. After training YCWA attempts to find jobs for the girls.

Christian Industrial Training Centre-Nairobi offers a three year program for artisans at the post-primary level and currently enrolls roughly 72 trainees per year for a total population of 200. It combines minimal academic qualification leading to KJSS examination and training leading to artisan qualifications.

2-Kenya——Village Polytechnics :

In 1971, there were 13 village polytechnics serving about 400 students. Village polytechnics emphasis is on the all round training such a craft skills, agricultural knowledge small scale business management and general economic understanding of young people looking for employement opportunities in the rural areas. These polytechnics are financed by non-government organizations such as National Christian Councile of Kenya, country Council Grants, local church collections and others Government has not aided directly to village polytechnics. The important problems in such programm are: (a) Over capitalization of the programm. Large professional staff and expensive building lead

to inappropriate types of training and inappropriate student expectations, (b) how to integrate such programm within the broader context of rural development, (c) how to provide coordination and planning at the national level and (d) how to expand the scope of such programm.

3-Govt. Prevocational Training Youth Programm :

A government prevocational training youth programm is being built upon the youth centres and village polytechnics in order to create an integrated network of prevocational youth training projects. The main aim of this programm is to train primary educated youths in such a way that they can make use of opportunities on the land and informal economic activity in rural and urban areas. But the success of such project depends upon not only the change in the mental set-up of Youths to feel proud in labour activities but also on the attitude of society.

As rightly emphasized by ILO report that, "as long as education refers only to present formal method of academic instruction directed towards the uncertain matters of a body of abstract knowledge which is periodically measured by the examination system, Harambee school will strive to immitate conventional academic secondary schools village polytechnics will tend to become conventional vocational schools and so on."[32]

(ii) Training Programs for Adult Population in Rural Areas :

"East Africa Yearly Meeting" is such a project financed by church. It was started in 1962 with the aim of providing village population an intensive instructions and guidance on such topics as vegetable growing, live stock raising, nutrition and family planning. Some 15 to 20 village level workers work in 30 villages in the western province of Kenya for providing information on such subjects. The other such programm which has training as a minor function is Kenya Tea Development Authority" which is a quasi-government organization with principal objective to promote tea production among small producers. Although it difficult to evaluete the impast of such programms but one can safely conclude that such projects can not help and have not helped Kenya in solving its critical socio-economic problems because their impact is limited and cost may be greater.

32. Ibid., p. 238.

(iii) **Multi-Purpose Training Programms :**

In this respect there are two projects which have been implemented with little achievements.

(a) Kenya National Youth Service : Kenya National Youth Service (KNYS) was established in 1964 to absorb large number of youth who were former Man. Man freedom fighters and other unemployment from youth wings of various political parties. The main function of service is to give traning to youth for employemnt. The basic problem with such programm is its political nature and selection of mainly based on political pressures. The expenditures for such programm is very high, and youth who can not find jobs become permanently dependent on such programm. The number of applicants has always outnumbered the number of places available. Government is integrating this programm with village polytechnics to make it more beneficial for society.

(b) Radio Correspondence Courses in Kenya : In April 1967, the correspondence Course Unit (CCU) was started at the University College, Nairobi (now the University of Nairobi). Courses were directed at preparing primary school teachers and other adults for the Kenya Junior Secondary Sehool (KJSS) examination. "At 'the end of 1973, there were nearly 2.000 students taking courses under this programm"[33] Such programm needs intensive research on the type of information to be provided and also means should be adopted to follow-up work on students, particularly primary school teachers.[34]

Dilemmas of Kenyan Educational System : Kenyan educational saystem is intensifying the socio-economic crisis which all developing countries like Kenya are facing at present ——the unemployment problem and problems related to urbanization. Hansan has rightly pointed out that "the first great dilemma of African education : the dream of a population that is entirely schooled, the tapping of Africa's greatest resources (its people), and the stark of a growing mass of desillusioned, umproductive, uprooted schooled children, flocking to the cities where they join the ranks of the unemployed, or in some instances remaining on overcrowded holdings in the countryside, dis-

33. James R. Sheffield and Victor p. Diejomaoh, "Non-Formal Education In African Development", United Nations, New York, 1972, p. 175.

34. Ibid., Figures on Non-Formal Education as quoted.

gruntled and convinced their "education" entitled them to better things."[35]

The irrelevance of education to the realities of practical life and socio-economic requirements of a country is the second important dilemma of education. Abstract education is an absurd education. Conventional educational system with conventional curriculum and examination system is producing students who can not imagine and think over the problems independently in practical life Conventional education produce conventional minds. Education is inappropriate and irrelevant for the solution of problems with lot of superficial attributes attached to it. "Educational expansion is difficult in countries with limited economic resources and qualified personnel, educational rethinking is difficult everywhere. The tragedy in African education in our time is not, as it is often stated, that there is too little schooling; the tragedy is that what there is of it is inappropriate, partakes too much of the superficial attributes of schooling everywhere and too little of the qualities of education which make a difference."[36]

While talking about relevance of education to social and economic system, it does not mean that education should not help in striving for changes in socio-economic conditions of a country. It is a problem of preparing students to face the realities of economic uncertanity and disparity, ideological conflict, social disruption of traditional norms, political immaturity, future desillusionment and frustrations.

Another important dilemma of Kenyan education is emphasis and too much relience on centralized examination system. These examinations have led to students with no intellectual initiative in talking the problems but just to memorize the information given in book and reproduce them in examinations.

Another important dilemma of educational system as it evists in Kenya is of recruiting and trainning an adequate number of teachers who are the real builders of a nation and play an important role in building up generations of a society. Unfortunately teachers have lost the prestigious status which they were holding in the past societies with

35. John W. Hanson, "Imagination and Hallucination in African Education, Institute for International Studies in Education, Michigan State University, Michigan, P. 7.

36. Ibid., p. 3.

the changes in socio-economic structure of societies. In addition they have not been able to come forward with the solutions of the problems which developing countries are facing. The economic incentives which are considered the base of a capitalist system has deprived education from talented and innovative teachers. "Salary structures which would attract and hold good teachers are not feasible in periods when having capital investment is necessary for the economic health of the nation." Frustrated and disgrunted teachers will produce frustrated and disgruntled generations. It will be illogical to expect from teachers to be above the economic considerations when all the individuals in society are busy in grabing as much as they can.

One other serious dilemma in educational structure as it exist in Kenya relates to dichotomy between formal education and non-formal education and training. Non-formal education and training is considered inferior as compared to formal education. Because vocational training and training produce people who are considered lower in socio-economic ranking of a society in comparison with people which are product of formal education. White collered jobs are the aspiration of all young people in such societies. Working on machines, on farms and other such jobs are looked down upon in developing countries. ILO report has rightly pointed out that" as long as formal education system operates as it does (under the influence of distorted incentives that exist in the labour market and in society in general), the Harambee secondary schools or village polytechnics will remain poor relations, able to make only little headway. These parallel institutions will strive to imitate the conventional academic schools, and this is unavoidable because it is the sensible thing to do as long as people with formal education are rewarded with higher incomer and better job opportunities than others"[38]

Vocational education considered as a solution to the problem of educated youth is a fallacy which has been proved in all the developing countries. It is just merely shift from one type of education to other. As pointed out by Hanson that "vocational education may also be a fallacy—not because it alone can not solve all the social and economic ills of countries with populations growing more rapidly than economies—but vocational schools as we have known them are somehow out

37. Ibid., p. 27.

38. ILO, Op. Cit., p. 22.

of joint with reality in ways which our biases lead us to overlook and, being out of joint with reality, are unable to make the more limited contribution to economic growth and personal fulfillment which they might legtimately be expected to make."[39]

One other reason for educational system as it exist and is not progressing is administrative structure of the systems. As a part of the whole system, Ministry of Education is trying to maintain the status quo.

Conclusions : Concluding one can say that one type of education or other in the existing structure of socio-economic system is bound to fail in solving the problems which developing countries are facing. Integrating with work and work with education is an approach to be adopted by developing counries. Changes in educational structure and educational reforms will never bear any fruits until and unless the whole structure of society is changed. The existing economic relations and attitude of society towards workers has to be changed for any successful changes in educational system and there is no other way except change in the whole structure.

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39. John W. Hanson, Op. Cit., p. 33.

Economic Policies, Growth Performance and Income Distribution in Pakistan : An Econometric Study*

I. INTRODUCTION

The purpose of this paper is to present an analysis of the reflection of Pakistan's economic policies on growth performance and income distribution during 1963/64-1971/72. The study presented in this paper will enrich the literature on the interaction between economic growth and income distribution and at the same time offers an analysis on the general applicability of Kuznet's relation in less developed countries which has been the topic of academic debate for many years.

In our analysis we take the prevailing institutional setting into account in explaining the Pakistan growth process and performance. The paper is divided into the following sectors :

Section II :

Economic Policies and institutional Setting : This Section offers an explanation of economic policies adopted during 1963/64—1971/72 and the institutional setting within which these policies were carried out.

Section III :

Growth Performance : This sector presents a Statistical survey of the changes in the structure of the Pakistan economy between 1963/64—1971/72 in terms of sectoral Pattern of output, employment and income.

Section IV :

Income distribution : This section presents an analysis of the distribution impact of the economic growth during 1963/64—1971/72.

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Section V :

Concluding Remarks : This section briefly outlines the main conclusions of the study.

II. ECONOMIC POLICIES AND INSTITUTIONAL SETTING

The main objective of Pakistan's economic Policies after 1960, within the framework of a private and mixed economic system, has been to achieve a high rate of economic growth. To stimulate faster economic growth, monetary, fiscal and trade policies have sought to affect the comosition of real output by increasing public and private sector investment (Lewis (1969)

Price stability was viewed as the necessary concomitant of the overall economic policy in generating investment which was to be financed by both domestic savings and foreign sources. Consequently deficit financing of government investment as well as frequent adjustments of the exchange rate were not adopted. Pakistan has consistently placed more emphasis on a monetarist approach to check inflation by controlling the money supply in 1960's. Money Supply has been influenced through changes in the interest rate and the imposition of credit ceiling on the banking system.

Trade policy has been based on the principle of Protection with the aim of speeding up industrialization. The policy has emphasized relatively high tariffs and the development of import-substitute industries. The devaluation in 1960's has been avoided in order to encourage foreign investmnet and to facilitate the importation of capital goods, raw materials and auxiliary materials by domestic industries. Foreign trade has also been directed towards the encouragement of exports. The measures taken were on supply side through the incentives offered to the exporters in the shape of Export Bonus Scheme.

The main features of institutional setting within which these economic policies were carried out are the following :

1. An economy inherited from the colonial period characterized by a lopsided structure of favouring the modern sectors

which are controlled by the small elite of the society and inefficient state economic units.

2. Inegalitarian social structure which was mainly reflected in the weak position of the masses with respect to land holding, marketing position and political power.
3. Market imperfection which was reflected in the nature of access to resources and price formation of goods which was deterimental to a sound economic process.

III. GROWTH PERFORMANCE

The overall dimensions of Pakistan's economic growth during 1963/64—1971/72 are reflected in the growth rates of aggregate and per-capita income during this period. Aggregate domestic income, at constant 1959/60 prices, grew at an average annual rate of 5.88 percent. With an average growth rate of population of 2.88 percent per annum, the growth rate of real per capita income during 1963/64—1971/72 was 2.44 per cent per annum. Table 1 shows gross Domestic Product at Constant 1959/60 price during 1963/64—1971/72 and Table 2 shows the average compounded annual growth rates of gross domestic product, population and per capita income during the same period.

The Sectoral distribution of both gross domestic product and employment serves further to indicate the economy's growth and growth process. Table 3 shows the sectoral distribution of gross domestic product during 1963/64—1971/72, and Table 4 shows the sectoral distribution of employment for 1968/69 and 1971/72.

TABLE 1

Pakistan : GDP, 1963/64-1971/72 as constant 1959/60 market prices.

(in million Rs.)

Year	*DGP*
1963/64	21356
1964/65	23360
1965/66	25126
1966/67	25901
1967/68	27659
1968/69	29454
1960/70	32336
1970/71	39368
1971/72	32674

TABLE 2

Pakistan : Average Compounded Annual Growth Rates of GDP, Population and P. C. Income 1963/64-1971/72

(in percentages)

Distription	*Rate of Growth*
GDP	5.88
Population	2.88
P. C. Income	2.44

TABLE 3

Pakistan : Sectoral Distribution of GDP at constant 1959/60 market prices (in %age)

Sector	1963/64	66/67	67/68	68/69	69/70	70/71	71/72
Agriculture	41.26	37.95	39.70	38.97	38.89	37.65	38.60
Manufacturing	14.97	15.57	15.51	15.82	16.04	16.28	15.38
Construction	4.20	4.01	3.75	4.47	4.20	4.29	3.56
Wholesale & Retail Trade	13.74	13.98	13.57	13.65	13.78	13.76	31.51
Others	25.83	28.49	27.47	27.09	27.09	28.02	28.95
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 4

Pakistan : Employment by Economic Sectors
1968/69-1971/72 (in %age)

Sector	*1968-69*	*1971-72*
Agriculture, Forestry, Hunting & Fishing.	55.79	57.32
Manufacturing	15.63	12.37
Construction	3.70	3.41
Wholesale & Retail Trade etc.	10.33	9.89
Others	14.55	13.70

TABLE 5

Pakistan : Estimates of Average Relative Sectoral Productivities

Sector1	*968/69*			*1971/72*		
	Relative Employment(%) (E)	Relative Income(%) (Y)	Relative Productivity (Y/E)	Relative Employment(%) (E)	Relative Income(%) (Y)	Relative Productivity (Y/E)
Agriculture, Forestry,	55.79	38.97	0.70	57.32	38.60	0.67
Hunting & Fishing. Manufacturing	15.63	15 82	1.01	22.47	15.38	1.23
Construction	3.70	4.47	1.21	3.41	3.56	1.04
Whole & Retail Trade etc.	10.33	13.65	1.32	9.89	13.51	1.07
Others	14.55	27.09	1.86	13.70	28.95	2.11

These figures can be used to estimate the relative sectoral productivities in 1968/69 and 1971/72 as shown in Table 5.

As Table 3 and 5 indicate a sectoral transformation in the Pakistan economy during 1968/69—1971/72 did not take place to a significant extent. However, the transformation in agriculture was the poorest with relative productivity declining from 0.70 in 1968/69 to 0.67 in 1971/72. The relative productivity in manufacturing sector increased from 1.01 in 1968/69 to 1.23 in 1971/22. These figures reflect the government policies adopted during the 1960's.

IV. INCOME DISTRIBUTION

Due to the absence of personal income statistics the method adopted to measure income distribution is the concentration ratio of consumption expenditure. The concentration ratio for each item of consumption expenditure is also computed in order to enable an estimate to be made of the extent to which the low income group suffers as inequality of consumption of basic necessities increases.

Recently Kakwani & Podder formulated the analogy of the computation of the Gini Coefficient of incom distribution with that of the concentration ratio of consumption expenditures distribution. Their formulation can be summarised as follows : let X be the total per-capita expenditure of a household with distribution function of (X) which is defined as,

$$F(x)=\int_0^x f(x)\,dx \qquad (1)$$

The distribution function of equation (1) indicates the proportion of household having total per-capita expenditure less than or equal to 'X'. The proportion of total per capita expenditure of these household is given by,

$$F_1(x)=\frac{1}{\sigma}\int_0^x x\,F(x)\,dx \qquad (2)$$

where σ is the mean total per-capita expenditure of the households. The Lorenz Curve is formed by the relationship between F(X) and F_1 (X) and the given index derived from this curve is defined as equal to one minus twice the area under this curve which is given as,

$$G=1-2\int_0^\infty F_1(x)\,dx \qquad (3)$$

The use of consumption expenditures as a proxy of income lead us to look at the Engel function of the commodities consumed. g_i (x) be the Engel function of the ith commodity. Then the distribution

function of $g_j(x)$ can be defined as,

$$F_i\, g_i(x) = \frac{1}{y_i} \int_0^x g_i(x)\, f(x)\, dx \qquad (4)$$

Where y_i is the mean per copita expenditure of the households on the ith commodity. Equation (4) is equal to the proportion of ex. penditure on the ith commodity by households hoving total per-capita expenditure less than or equal to x The relationship between $F_i g_i(x)$ and $F(x)$ is called the concentration curve of the ith commodity. Analogous to the Gini index derived from the Lorenz Curve, the concentration ratio is defined as one minus twice the area under the specific concentration curve which is given as,

$$CR_i = 1 - 2 \int_0^\infty F_i\, g_i(x)\, f(x)\, dx \qquad (5)$$

The concentration ratio of consumption expenditures as specified by equation (5) is then computed from the Lorenz function of consumption expenditures for its expenditure distribution implication. The Lorenz function of consumption expenditures from group data is Specified as,

$$\eta = a\pi^{\alpha} (\sqrt{2} - \pi)^{\beta}$$

$$a > 0,\ \alpha > 0 \text{ and } \beta > 0 \qquad (6)$$

$$\text{where} \quad \pi = \left(\frac{F_i + \overset{*}{F}_i}{\sqrt{2}} \right)$$

$$\text{and} \quad \eta = \left(\frac{F_i - \overset{*}{F}_i}{\sqrt{2}} \right)$$

F_i is the proportion of household by expenditure bracket $\overset{*}{F}_i$ is the proportion of households total per capita expenditure by expenditure bracket ($i = \ldots\ldots, n$). The concentration ratio is then computed using the following formula,

$$CR = \sqrt{2} \int_0^{\sqrt{2}} a\, \pi^{\alpha} (\sqrt{2} - \pi)^{\beta}\, d\pi$$

$$= 2a (\sqrt{2})^{1+\alpha+\beta} B(1+\alpha, 1+\beta) \qquad (7)$$

B $(1 + \alpha, 1 + \beta)$ is the Beta function which can be computed by using tables of the incomplete Beta function of tables of the complete Gamma function.

In using tables of the complete Gamma function the following relationship of the Beta function and the Gamma function is observed,

$$\text{Beta } (1+\alpha,\ 1+\beta) = \frac{\text{Gamma } (1+\alpha)\ \text{Gamma } (1+\beta}{\text{Gamma } (1+\alpha+1+\beta)}$$

To estimate the Lorenz function as given in equation (6) for the computation of the concentration ratio, the following estimating equation is used,

$$\log q_t = \log a + \alpha \log p_t + \beta \log r_t + e_t \qquad (8)$$

where $q_t = \dfrac{F_i - \overset{*}{F}_i}{\sqrt{2}}$, $p_t = \dfrac{F_i + \overset{*}{F}_i}{\sqrt{2}}$

$r_t = \sqrt{2} - p_t$, e_t = disturbance term

The ordinary least square method is then applied to get the regressive coefficients of equation (8) where the term constant in the estimated equation is the antilog. Table 6-8 show the regression results together with the concentration ratios of the consumption expenditure items and the total consumption expenditures separately for rural, urban and combined Pakistan.

TABLE 6

Estimate of the Lorenz Function by Items for Rural Pakistan, 1972

Items	a	α	β	R^2	C. R.
Food & D.	0.324	0 878	0.844	0.998	0.350
Clothing & f.	0.353	0.959	0 854	0.999	0.365
P. Effects	0.494	0.898	0.884	0.999	0.518
H. Rent	0.618	1.051	0.915	0.997	0.594
Fuel & l.	0.278	0.890	0.817	0.999	0.303
Furniture & u.	0.528	0.953	0.889	0.999	0.537
Miscellaneous	0.514	0.963	0.896	0.998	0.520
Total Expenditure	0.405	0.948	0t867	0.999	0.419

TABLE 7

Estimates of the Lorenz Function by Items for Urban Pakistan 1972.

Items	a	α	β	R^2	C.R.
Food & d.	0.337	0.975	0.918	0.999	0.345
Clothing & f.	0.379	0.924	0.932	0.999	0.383
P. Effects	0.504	0.981	0.965	0.999	0.487
H. Rent	0.556	1.022	0.979	0.999	0.535
Fuel & l.	0.311	0.947	0.911	0.999	0.315
Furniture & u.	0.647	1.038	0.993	0.999	0.603
Miscellaneous	0.638	1.034	0.991	0.999	0.593
Total Expenditure.	0.491	0.949	0.925	0.9 2	0.466

TABLE 8

Estimates of the Lorenz Function by Items for All Pakistan, 1972

Items	a	α	β	R^2	C. R.
Food & d.	0.318	0.881	0.839	0.999	0.344
Clothing & f.	0.363	0.964	0.856	0.999	0.374
P. Effects	0.514	0.919	0.890	0.999	0.533
H. Rent	0.605	1.023	0.912	0.999	0.589
Fuel & l	0.294	0.903	0.827	0.999	0.317
Furniture & u.	0.585	1.002	0.903	0.999	0.580
Miscelloneous	0.571	0.595	0.905	0.999	0.565
Total Expenditure.	0.423	0.947	0.869	0.999	0.437

TABLE 9

Concentration Ratios of Consumption Expenditures in Pakistan

	Rural	*Urban*	*Combieed*
Present Study (1972) data	0.419	0.466	0.437
Bergan (1964) data	0.356	0.445	0.381

These calculations are based on the published data as obtained through the Survey of Current Economic conditions in Pakistan (Household income and Expenditure) and collected by the Central Statistical Office of Pakistan for the Year 1971/72. For making of comparison over time we have also reported the concentration ratios for the year 1963/64 in Table 9 as calculated by Bergan (1967). These results indicate that all concentration ratio of the consumption expenditures increased between 1963/64 and 1971/72. The higher concentration ratios of consumption expenditures imply that the income inequality in Pakistan between 1963/64 and 1971/72 became greater and that the poor benefited very little if at all.

V. CONCLUDING REMARKS

The comparison of results for the period 1963/64—1971/72 confirms the Kuznet's hypothesis which asserts that changes in economic welfare of the population are positively related to changes in the level of national income and negatively related to changes in inequality of income distribution using the Gini coefficient of household consumption expenditure as the measure.

The higher concentration ratios in 1971/72 for all three regions urban, rural and combined Pakistan-indicate that the levels of living of masses deteriorated during the period under study.

If this estimate can be used to detect the deterioration of the levels of living of masses then the results support the Adelman-Morris assertion that growth at low income countries leads to worsening absolute income for the poor.

The inequality as described by the Kaznet's Curve-an inverse-U shaped relation between income inequality and GNP per-capita may not necessarily occur or may be much less pronounced as recent studies of the parameters of economic growth in Taiwan and South Korea demonstrate (Fei, 1976).

In these two countries initial planned development processes were concomitant with necessary and effictive social reforms which laid the basis for more egalitarian economic relations in the society. In Pakistan, on the other hand, The institutional setting as described in Section II has been continuously prevailing which is obviously

detrimental to such process as towards a more egalitarian structure of income.

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Delinking of Pakistani Rupee

The Pakistan Government has delinked its rupee from the U.S. dollar with effect from January 8, 1982. Pak rupee was pegged with U.S. dollar in order to provide stability to Pakistan currency. With time, dollar as an international currency became weaker and weaker and its value with other currencies fluctnated in a rapid way. The result was that it could not provide stability to Pakistan currency vis-a-vis other currencies. Fortunes of rupee were buffeted by fortunes or misfortunes of the dollar and we had an exchange rate which depended on the U.S. economy.

With the delinking of Pakistan rupee, we have moved away from fixed exchange rate system to a managed floating exchange rate. Pakistan rupee/dollor rate is being fixed daily by the State Bank of Pakistan with reference to a trade weighted basket of currencies of the country's major trading partners. Under a system of freely floating exchange rates, no par of enchange is fixed. Nor does a former fixed par apply, because in the case of inconvertible money, such a large quantity comes into circulation that the old par no longer has any relevence and the government makes no effort to enforce it. The free or floating rate is allowed to seek its own level.

Exchange rate is held as stable as is possible and depreciates or appreciates without undue strain. The desired degree of exchange stability will be achieved through buying and selling operations by the monetary authourities in the foreign exchange market. Exchange control is employed to eliminete disequilibrating capital flight movements.

The compromise solution suggested above implies that the exchange rates which are kept stable must approximate rates at which

balance of payments equilibrium can be maintained over longer periods, so that over an extended interval of time, any loss of reserves can be expected to be made good by matching inflows. Such rates may be termed as the "equilibrium rates of exchange", which again may be defined as "the rate which, over a certain period, maintains the balance of payments in equilibrium without any net change in the international curency reserves.

The basic idea behind a system of flexible exchange rates is that of an equilibrium price, there is some exchange rate that will equate the demand for and supply of foreign exchange. The purchasing power parity theory determines the equilibrium rate of exchange, and under these conditions changes in the exchange rate will restore equilibrium by inducing shifts in exports and imports.

The managed floating exchange rate system adopted in Pakistan can have the following good points.

1. Simplicity

The first of the advantages claimed for the system is its simplicity. The exchange rate moves freely to equate supply and demand, thus clearing the market and eliminating the problem of scarcity of any one currency, countries do not have to induce changes in prices and incomes to maintain equlibrium in the B.O.P. Certainly, of the variables effecting the demand for and supply of any particular currency the exchange rate is the easiest to alter.

2. Continuous adjectment.

A system of flexible exchange rates provides for continuous adjustment, thus avoiding the adverse effects of prolonged periods of disequilibrium. A persistent disequilibrium permits inappropriate use of recourses to continue and even to become aggravated. It, therefore leads to a sudden shock when a country eventually takes the necessary corrective measures. When long delayed, the resulting changes will be more drastive and difficult to effect. Gradual changes in exchange rates would eliminate these sudden shocks and drastic adjustments. They could not eliminate the need for adjustments but permit the necessary changes to take place by gradual steps.

However, the delinking policy is going to have adverse effects on the economy due to following reasons.

1. Low Elasticities.

If the elasticities are too low, depreciation of the weak currency will simply worsen the payment im balance. For depreciation to prenent or eliminate a deficit, it must reduce domestic currency expenditures on imports relative to domestic currency receipts of exports. If this is to occur, it is necessary that the sum of the elasticities of demand for imports and exports of the country concerned must be greater than one. The empirical evidence shows that these elasticiaties in Pakistan are low so that depreciation of this weak currency would worsen the deficit.

2. Deduction in foreign trade.

The second argument against flexible rates is that they introduce a degree of uncertainty harmful to international trade. The uncertainty exists because these rates are unstable. Although Pakistan has allowed the system of 'Forward Exchange', but it increases the cost.

3. Speculation.

Under a system of flexible exchange rates, speculation is destabilizing. It tends to aggravate fluctuations in the exchange rate caused by trade. For speculators, a fall in the exchange rate is a signal for further decline, and their action will cause the movement in the exchange rate to be larger than it would be in the absence of speculation. So speculation is destabilishing.

4. Inflationary Effects.

Flexible exchange rate will have an inflationary impect on the Pak. economy, because depreciation of the exchange rate will cause a rise in the domestic price level, Depreciation of a curreney means that imports become more expensive, and the increase in import prices leads to an increase in the general price level. Let us assume that a country's imports amount to 20% of its national income, and that its currency depreciates by 15%. This will lead to on increase in import

prices of 15%. If this increase is carried through completely, and no secondary effects occur, the general price index in the country will increase by 30% (1/5th of 15%). Here a depreciation produces an inflationary effect.

From the above we can conclude that delinking will have adverse effects on the economy.

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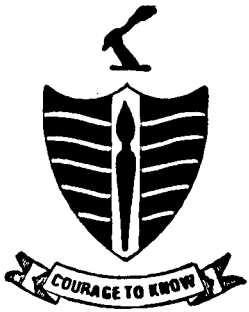

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