PRODUCTIVE EFFECT OF CONSUMPTION — REVALUING THE SOCIAL COST OF EMPLOYING UNSKILLED LABOUR IN DEVELOPING COUNTRIES.

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Abstract

Little & Mirrlees, following the traditional investment theory, have attributed a social cost component to the additional consumption of the unskilled labour in the advanced industry in developing countries. However, recent research has shown that increased consumption of such labour is part of human capital formation, as it (additional consumption) increases labour productivity, value of which is greater than that of the resources used for the extra consumption. As the extra consumption of the unskilled labour in the advanced industry, increases 'uncommited government income' rather than reduces it, appropriate shadow wage rate of unskilled labour in advanced industry has to be zero.

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Introduction

The problem of estimating the correct opportunity cost of unskilled labour in the organised sector in developing countries has been the centre of focus in modern development literature. Little & Mirrlees (LM) or OECD (1) and UNIDO (2) models are two of the widely accepted analytical works on this problem. However, our main interest in this paper is on the method followed by LM model in estimating the shadow wage rate (SWR) of the unskilled labour in the organised industry.

In estimating the social cost of employing a unit of unskilled labour in the organised industrial sector, LM has taken several variables into account, among others, the value of uncommitted government income measured in terms of consumption committed through employment (S), additional resources devoted to consumption as a result of increased employment (c). consumption of the unskilled wage earner in the organised industry (c), and the marginal productivity of labour in the rural sector from where unskilled labour is drawn to the organised industry (m).

The formula which LM used to estimate the shadow wage rate of unskilled labour in the organised industry is:

$$SWR = m + (c'-c) + [(1-(1/s)] \ (c-m)]$$
$$= C' - (1/s) \ (c-m).$$

We do not intend to examine the validity of the variables in the above formula, other than that of c, the actual consumption of the unskilled labour. LM model has treated c, as committed to consumption of the wage earner in the same footing as the conventional theory had conceived, in that the consumption is an end in itself and it does not contribute for further increase in productivity of labour or output. Accordingly, resources utilised for the consumption of such labour is not available to the government in the form of 'uncommitted government income' and hence it has a social cost component.

LM model quite rightly pointed out the political constraints on the government's ability to amass sufficient savings for the required investment.

In such a context, quite naturally, resources available for investment have to be treated at a premium. Accordingly, the value of resources committed to current consumption is estimated as a ratio of the present value of a stream of future incomes which such resources could generate had they been diverted to investment. One unit of resources used in current consumption is equal to $1/s$ units of resources used for investment.

The main purpose of this paper is to indicate that LM's treatment of consumption of the unskilled labour is not in keeping with the prevailing conditions in developing countries. The increased consumption of unskilled labour in organised industry in developing countries is not an increase in consumption as defined in the traditional theory, but is human capital formation through increased energy intake (nutritional effect) which enhances labour productivity. In fact Leibenstein (1957) pointed out this for the first time (3). The value of the increased output resulting from such enhanced productivity may be higher than the value of resources committed for consumption itself so that such increased consumption increases the available 'uncommited government income' rather than reduces it. Accordingly, in most cases the employment of unskilled labour in the organised industry in developing countries does not entail any net social cost other than those associated with the loss of the marginal product of the unit of labour that has been transferred from the rural sector as the social cost of extra consumption is matched by increased productivity.

Nutrition and Labour Productivity.

Consumption level of the unskilled labour in developing countries is rather low in that their energy intake is inadequate to meet the energy expediture requirements for the type of work they are normally engaged in. The calorie intake is usually insufficient for exerting oneself to the maximum effort and this has economic implications. Increased energy intake by such under-nourished labour could lead to higher productivity which results in an increase in output and that value is more than the value of resources used for increased energy consumption (productive effect of consumption.)

A number of studies have shown that increased energy intake by under-nourished labour results in higher productivity, among others, Key et al (1950), FOA (1962), ILO (1965), Batawia (1967), ILO (1968), Blanc (1975), Strauss (1986), Deolalihar (1988), Edmundson & Edmundson (1988), Shan & Adelman (1988), and Haddad & Boris (1991). (4)

Fei and Chiang (1966), have developed a model showing the relationship between consumption and labour productivity, taking into account different levels of energy intake. They have estimated the elasticities of effort and in two regions, 'defficiency and sufficiency,' the elasticity of

effort is more than one. (5) However, some economists are reluctant to include 'productive effect of consumption' into economic theory because of the ability of the human body to show wide individual variations in energy intake and work output. In certain instances it has been shown that the human body can adapt itself to low energy intake without affecting work output.

So called individual variations in energy intake and work output and its ensuing non homogeneity of factors of production is nothing new to economic theory. Even in the traditional theory labor is assumed to be homogeneous; but in actual fact each unit of labour differs from one other in terms of productivity. Nonetehless, the basic assumption in economic theory is that labour is uniform in the sense that they are equally efficient. Although individual intake and expenditure of energy showed wide differences the average energy intake and expenditure' in almost all studies, were more or less the same. Therefore, one cannot think of any valid argument to distinguish energy intake and expenditure or nutritional effect, or for that matter, productive effect of consumption, from other economic variables.

The improved productivity which results from increased consumption is similar to Harrod's neutral technical progress. However there is an important difference between Harrod's neutral technical progress and the productive effect of consumption'; Harrod's neutral technical progress has been defined as a function of time, where technical progress results from research, learning by doing, training etc, which develop over time. Here in this case productivity increases result from increased consumption when a unit of labour moves from a production function corresponding to low consumption to one with high level of consumption. The capital labour ratio is the same in both these situations.

The basic assumption of LM model is that increased productivity of labour in the organised industry in developing countries has resulted from high capital labour ratio in that sector. This is only partly correct. Now we can show that the higher marginal productivity in the organised industry in developing countries results at least from two factors; higher capital labour ratio and higher level of consumption. Hence, it is incorrect to attribute the entire difference in the productivity of labour to improved capital availability,

Another factor which prevents economists from incorporating the productive effect of consumption into the production function is the possibility of factor substitution when the marginal productivity of a factor changes. When marginal productivity of labour increases, according to neoclassical assumptions, change of capital labour ratio becomes more profitable. That is, the same output now could be obtained with less labour. Accordingly, now capital labour ratio has to improve.

However, this analysis is relevant only if the labour augmentation res- ults within the same production function. The augmentation of labour in this case does not arise in the same production function. Labour arrives with a certain level of consumption and jump into a new higher level of consumption as they start work in the new work place. Hence, the impro- ved productivity occurs right at the beginning of work in the organised industry and is assumed to be constant right through out. Estimates of labour requirements for a project are made on the basis of the existing marginal productivities of labour in that sector, hence the marginal pro- ductivity is embodied and does not influence the decision on labour capital ratio. As wage rate is inelastic downwards no alternative marginal productivities of labour are available for the decision makers. However, when labour is continually used, due to reasons explained in the tradi- tional theory, the productivity can improve, which is outside our area of concern.

This possibility can be examined with the help of the neoclassical well behaved production function.

Here the production function is defined as $Q = m (K, E)$, where K is capital and E, is labour in efficiency units, where its efficiency depends on both capital per unit of labour and consumption level of labour;and the production function is assumed to be well behaved. In figure 1, y, is output per unit of labour and 1, labour per unit of capital. We have also drawn a hypothetical production function, on the assumption that labour in the organised industrial sector consumes the same level of calories as would be normal in the rural sector, had they been working in that sec- tor. In other words, in the hypothetical production function a unit of labour is less efficient, despite having the same capital per unit of labour, because their energy intake is less.

At the level of 1' the marginal productivity of labour in the organised industry is mo, which is determined by higher capital labour ratio and higher consumption of labour. The hypothetical production function shows that at the same capital labour ratio the marginal productivity of labour is lower, mh because of lower levels of energy intake (the consumption level of labour there is m, where $m < c$). The difference between mo and mh is the 'productive effect of consumption'. This difference in produc- tivity can be converted into output and in some cases its value is larger than the value of resources committed for increased consumption, ie, c-m in the LM model. (Wickramasinghe 1978) (6)

Now it is clear that increased consumption of the unskilled labour increases 'uncommited government income' rather than reduces it.

Let us call this 'productive effect of consumption' δ then the LM formula for SWR can be modified as;

$$SWS = m + (c'—c) + [(1 — (1/s) \quad (c—m)] — \delta (c—m),$$
$$= c' — [(1/s) \quad (c—m) — \delta (c—m)[$$
$$= c' — [(1/s) + \delta)] \quad (c—m),$$

In most cases, $c' \leq [(1/s) + \delta) \quad (c—m)$

Hence, SWR = O

Objections to the inclusion of 'productive effect of consumption' in certain instances, come from the empirical findings which show that there is hardly any difference between consumption levels of the relevant parties in both rural and urban sectors. The energy intake in the relevant category in the urban sector sometimes may be just the same as that of the category of people who migrate to organised industry. However that does not change the situation, Firstly, this may be due to price differences between the two sectors which can easily be incorporated into c', and then the real consumption is the same. Secondly, on the other hand, if the labour takes the same level of energy even after shifting to the organised industry such labour is not operating at the optimal level. Further improvements in productivity could be achieved by increasing consumption. According LM model is not an optimal model. It has analysed a sub-optimal situation.

Now the government faces a further problem of deciding whether to divert resources to investment in physical capital or human capital in terms of increased consumption. The equilibrium is reached at the point where the marginal rate of return from investment in physical capital is equal to that from investment in human capital or higher consumption. As stated earlier, according to Fei and Chiang (1966) model the elasticity of effort of labour in the 'deficiency and sufficiency' consumption regions, is more than one, which suggests that the increase in productivity is larger than the increase in consumption. (7) LM model has ignored this aspect of the problem. LM model is applicable only to the third category, 'comfort region,' well fed labour, in Fei and Chiang model. This treatment is erroneous as the unskilled labour in developing countries does not fall into this category. It falls into the category whose consumption is in the 'deficiency' or 'sufficiency' region.

The position of alternative investments opportunities available to the government can best be shown by a diagram. In figure 2 horizontal axis shows consumption and right and left vertical axises show marginal productivity of effort and marginal productivity of investment respectively. Consumption increases from left to right and investment (Y-C), from right to left. The mhc curve shows the behaviour of the marginal productivity of human capital or effort, when consumption changes. The mpc curve shows the marginal productivity of physical capital as investment changes (investment increases from right to left).
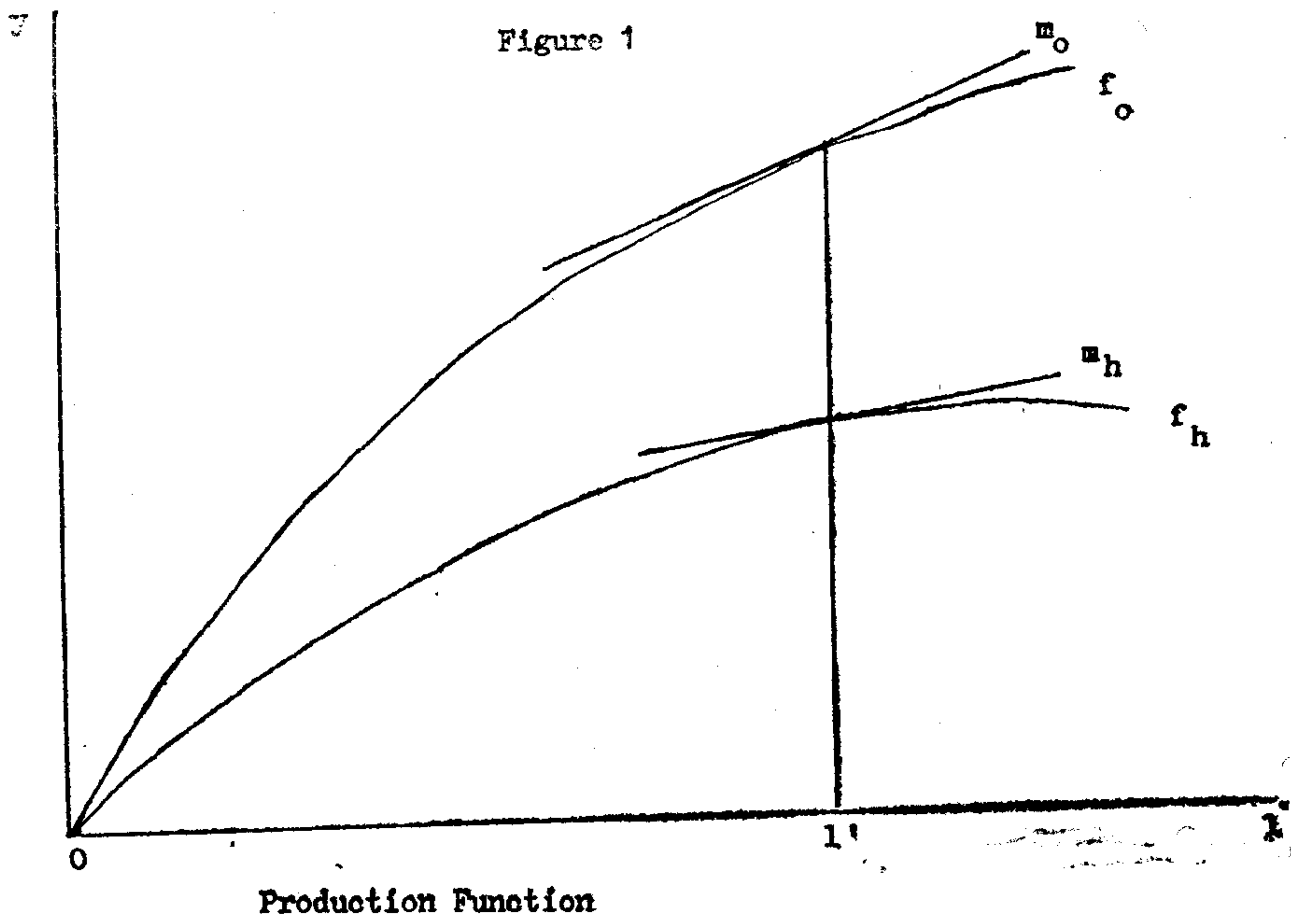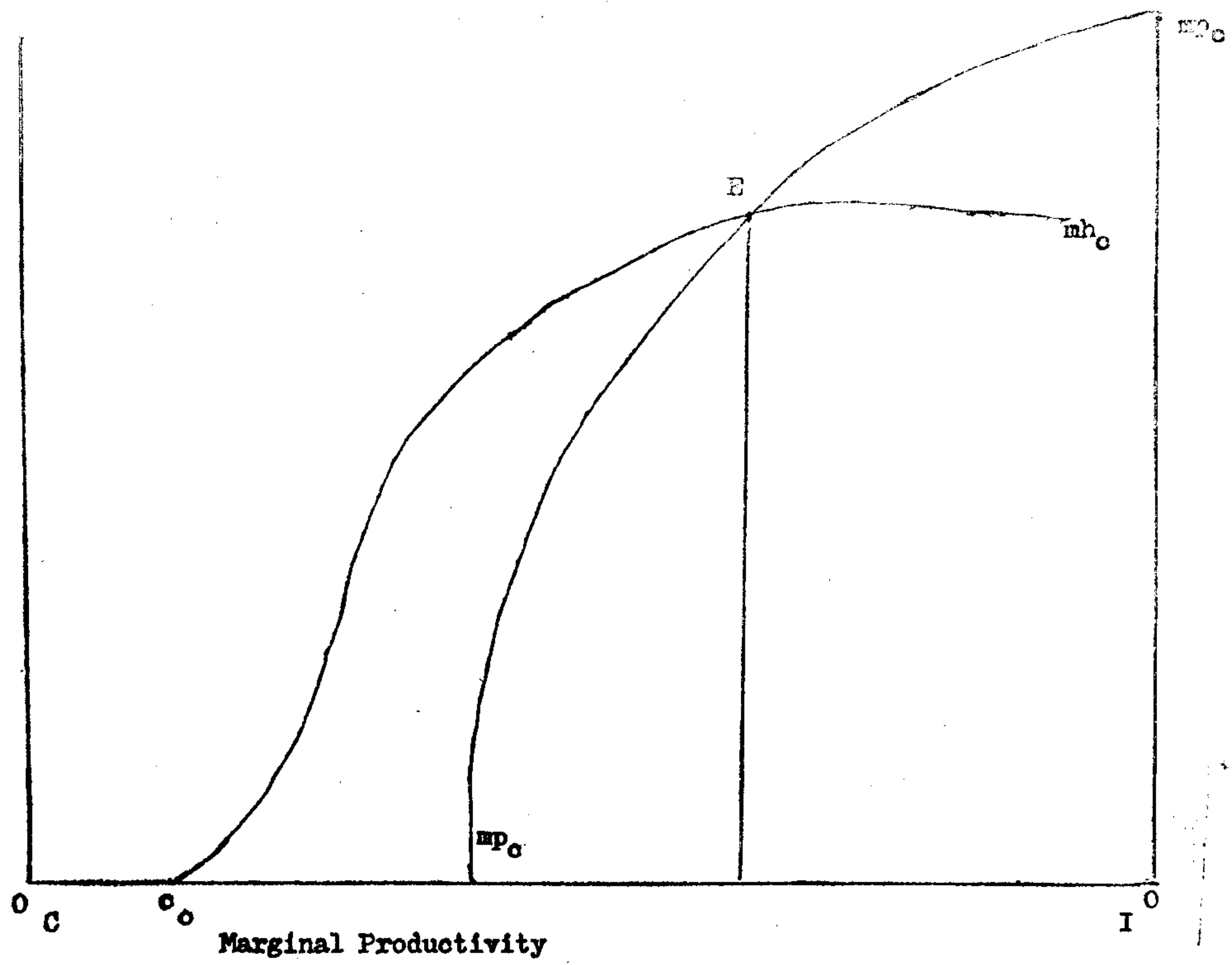
Figure 1

Production Function

Figure 2

Marginal Productivity

The effort curve starts from some positive level of consumption. When consumption is zero human beings cannot survive. It is only when the consumption reaches some minimum level that human beings get sufficient energy to apply its body and mind on any work. That level of consumption is defined as Co, and the effort curve begins from that level of consumption. Initially, when consumption is low the elasticity of effort is positive and also very large. This value while continuing to diminish remains positive until consumption passes 'deficiency and 'sufficiency' regions. Once the consumption reaches the 'comfort region' the marginal productivity of human capital remains constant and extra consumption does not lead to higher productivity. The mpc curve needs no explanation; it is the normal mec curve.

At E, both marginal productivities of human capital and physical capital are the same. Hence, that level of consumption is the optimal, additional increase in consumption beyond cl may be relatively inefficient as the mhc is less than mpc (It is assumed here that the mhc curve is lower than mpc curve beyond E, and is either constant or falling). The constant mhc range may start either before, at this point, or at a higher consumption level. Whatever the level of consumption at which constant mhc originates, beyond that point consumption falls into the category envisaged by the traditional theory and also LM model. Until this position is reached the investment expenditure on physical capital too has an opportunity cost, because increased consumption too, could increase labour productivity.

Another study showed that the expected increase in value of the output resulting from 'nutritional effect' arising out of the increased consumption of 'free rice' in Sri Lanka was 2-3 times the cost of providing 'free rice'. (Wickramasinghe 1978) (8)

Another advantage in incorporating the 'productive effect' of consumtion into production function is that such analysis is more in keeping with the main objective of economic development 'growth with equity'.

Concluding Note

Increased consumption of the unskilled labour in developing countries is treated as having a social cost component because such consumption is assumed to be an end in itself. However, recent research has shown that increased consumption of such labour is human capital formation in the sense that it increases labour productivity.

Hence, the general assumption that increased consumption of such labour entails a social cost component has to be discarded. The value of extra production emanating from increased consumption is more than

sufficient, not only to cover the cost of increased consumption, but also to cover other associated expenses of employing unskilled labour in organised industry. In the above circumstances, what is more appropriate is to treat that the wages paid to the unskilled labour in the advanced industry is having no social opportunity cost and hence, SWR of unskilled labour in the advanced industry is zero.

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