

THE ROLE OF HUMAN CAPITAL IN DEVELOPMENT*

H. W. SINGER

The Harrod-Domar model is taken as a starting point. Both its insights and its weaknesses open the door for an analysis of the role of human capital. Since then, there has been a 'dethronement of GNP' and a shift towards a basic needs strategy within which human capital moves more directly into the centre of the analysis and takes on a new meaning. This is illustrated on the basis of various 'vicious circles' and specifically by looking at the problems of children. South Korea is discussed as an example of the prime importance of human capital.

The "traditional" or "neo-classical" model of development is the so-called "Harrod-Domar" or for short "H-D", model of development. The H-D model of development has two characteristics:

1. It identifies development with the growth of GNP (gross national product).
2. It singles out as the two determinants of GNP growth the ratio of resources going into investment (as distinct from consumption) and the capital/output ratio, or C/O, which measures the rate of productivity in terms of GNP growth of one unit of investment. For example, if the rate of investment is 15 per cent of GNP and the C/O is 3:1 (which would be a fairly average figure) the growth of GNP would be 5 per cent per annum.

Some comments on the H-D model are in order. In the first place, to identify development with GNP growth is not a very profound analysis. The GNP of a country may grow, while the majority of the people's standard of living becomes worse rather than better. The main reason why this could happen would be if the growth of GNP is accompanied by more unequal income distribution. In other words, a lot depends on whose GNP grows and whose doesn't. More modern analysts of development have paid much attention to the question of distribution as well as growth of GNP. The prevailing measurement of GNP distribution is the Gini co-efficient which measures the

* This is the text of a lecture delivered at Bristol University on December 22, 1980.

proportion of GNP accruing to the lowest, second lowest . . . etc., up to the highest decile of the total population. A widely accepted view by the well-known Nobel economist Simon Kuznets (the so-called “Kuznets curve”), is that in the earlier stages of GNP growth the Gini co-efficient rises, i.e. moves in the direction of greater inequality, reaches a maximum at some medium income level and then begins to fall again in the direction of greater equality, reaching a low level in the industrialized welfare states of the West as well as in the Socialist Bloc in the East.

Apart from the question of distribution of GNP, the simple identification of development with GNP growth also disregards what might be called the *quality* of GNP: an increase in armament production is treated for GNP analysis in exactly the same way as an improvement in the nutrition of young children. No distinction is made between humanly favourable and humanly irrelevant or unfavourable increments to GNP. As we shall subsequently see, the concepts of human investment and human capital have developed, in order to deal with both of these objections.

While serious objections could be made to the H-D model, and very few modern analysts would accept it as more than a starting point for analysis and policy, yet it is worth reflecting for a moment that in its day – the immediate post war period – the H-D model and its emphasis on linear stages of growth, which in due course all countries could be expected to travel – all this represented tremendous progress compared with the earlier analyses.

The earlier analyses were often indeed more “human” than the H-D model, but in a rather negative way. It was often believed that true economic development was a privilege of white people – the Japanese were somewhat grudgingly accepted as honorary whites. A slightly less “racist” version of this old pseudo-human view of development was that development can only proceed in temperate climates; as it happened of course, the temperate climates are inhabited by whites and honorary whites, such as the Japanese and Koreans. But the emphasis in this version was on climate rather than race: the tropical climate was supposed to be too enervating and unhealthy for man to overcome the barriers to development and achieve the famous “break-through into self-sustaining growth”.

We must not dismiss this old pre-H-D “pseudo-human” view too lightly. To the present day the tropics are unhealthy and ill health is clearly a factor undermining human productivity and human development. Tropical soils are often poor, although by no means always poorer than temperate zone soils. It is certainly a fact that the average GNP of the temperate zone is much higher – in spite of OPEC – than the GNP of the tropics and there is little sign of that gap closing.

There is of course a more radical left wing anti-racist explanation of this phenomenon: the white and temperate zone countries and peoples developed on the back of the tropical part of mankind. The human capital in the tropics was exploited as hewers of wood and drawers of water by the human capital in the temperate zone. It is certainly true that for long periods the “terms of trade”, i.e. the relative prices of tropical raw materials and temperate zone manufactures, tended to deteriorate to the disadvantage of tropical countries. This would have prevented the tropical countries to develop in line with their true human productivity, and would have enabled the industrial countries to develop beyond their own productivity.

The H-D model by fixing upon physical capital as the source of economic development (more or less implying that C/O was a secondary explanation) at least developed a non-racist theory of development, and given sufficient transfers of physical capital from the richer to poorer countries, opened up a possible avenue of more equal distribution of world income and growth for the poorer countries. That was precisely the vision of Keynes, the real father of the H-D model. In his essay on “The Economics of our Grandchildren”, he visualizes precisely such a world where the surplus capital of the richer countries cannot be productively invested because of diminishing productivity, due to saturation, hence would flow into the poorer countries with higher capital productivity, and thus serve as an equalizing force, producing a more harmonious and balanced world distribution. The Brandt Report with its emphasis on “massive transfers of resources” provides a distant echo of the Keynesian approach.

The H-D physical investment model in the days of its unquestioned sway in the 1950s and the earlier 60s, was usually interpreted as providing a case for higher or increased income inequality. Consumption had to be squeezed, and savings had to be increased; poorer people consume, while richer people and companies save; *ergo* the more income could be shifted towards richer people and towards company profits, the higher the rate of savings, the rate of re-investment and the rate of economic growth – and ultimately, in due course, the “safe” increase in consumption. The parallel with some aspects of monetarist policy presently in the UK is fairly obvious.

This scenario is based on two assumptions:

1. That the rate of saving and investment is in fact higher among rich people than among poorer people.
2. That consumption can be squeezed without affecting C/O , the productivity of capital investment.

The trouble is that these two assumptions are questionable and also mutually contradictory. As for (1), i.e. the higher savings/investment by richer groups, the evidence is not all that clear. Studies in Japan and elsewhere, including developing countries, have shown that small farmers, in

particular, can have a very high savings/investment propensity. The same has been found for small-scale producers in the so-called urban “informal” sector. Richer people on the other hand may have considerable demand for various forms of luxury consumption, especially luxury housing and personal services, so that their high savings/investment ratio is in doubt. Companies in developing countries are often foreign controlled and their high profits may be transferred abroad, rather than domestically invested. Even without going any further, it will be seen that the H-D model is of doubtful validity if used as an argument for unequal income distribution in developing countries.

It is, however, when we turn to the second assumption, i.e. that consumption can be cut without affection C/O, that we come to the heart of the subject of the role of human capital in economic development. There is plenty of evidence by now that low consumption standards of poorer people are a factor in low labour productivity, i.e. low productivity of additional units of physical capital when they have to be combined with labour in the production of output. Thus the squeezing of consumption may destroy output *via* reduced labour productivity at the same or higher rate than the increased rate of saving/investment creates output. Or to put the matter the other way round, the evidence is that labour productivity can be raised by higher consumption standards – better nutrition, better health services, better educational training services, supply of clean water, good housing, etc. Under the weight of this evidence, the assumption given of a fixed C/O has been rapidly undermined and with it the whole H-D model, which is *de facto* – although not necessarily in logic – linked with an emphasis on physical investment and a neglect of productivity.

The emphasis on the importance of human capital has resulted in the dethronement of GNP – and with it the H-D model – and its replacement by the reduction or elimination of poverty, embodied in the now widely accepted “basic needs” or BN model. This shift involves two steps:

1. The realization that the concept of development itself is meaningless unless it “trickles down” to the poorer groups, resulting in a reduction of poverty. But trickle down, in the absence of deliberate policies, has been shown to be unlikely and unreliable; a better development strategy is to develop “from the bottom up” rather than “from the top down”.
2. Hence, this requires the replacement of GNP growth as the primary objective, with reduction of poverty as a hoped-for derivative, with the opposite strategy: i.e. the reduction of poverty as primary objective, with GNP growth as a hoped-for derivative.

It is on this last point that the human capital concept comes into its own. It is precisely this expectation that the formation of human capital and reduction of poverty is favourable or indeed indispensable for economic

growth, which places the role of human capital into the centre of the development picture.

How does a disregard of basic needs lead to the destruction of human capital? Families living in absolute poverty, i.e. below the basic needs minimum income level, are caught in a "poverty trap" or "vicious circle of poverty", which sets up formidable barriers to their present or future income earning capacity. The clearest case is that of malnutrition. Leaving aside the case of children for the moment, there are disputes among nutritional experts about the relative importance of calories, protein, vitamins and other elements of nutrition, but these need not concern us here too much. They all agree that insufficient food undermines working capacity and makes people more vulnerable to illness and disease (thus reducing working time and increasing resources required for hospitals, etc.), reduces the capacity of adults for training and acquisition of new skills and the capacity of children for learning and absorbing education (thus undermining the future skill basis of the economy).

This is only one way the vicious circle goes round. It can also go the other way. The ill health, absence of clean water, etc., connected with poverty and the absence of health and other public services will undermine the capacity of people, and especially of children to convert the food which they are actually eating into human energy. The most obvious case is that of parasitical diseases. The great majority of people in a poor country and especially in the rural areas, suffer from parasites and the food they eat does not in fact feed the human being, but feeds the parasites inside them. The waste involved is fully equal to the waste of oil in rich countries through luxury motoring – except that the latter case does not set up an equivalent vicious circle of deprivation and deterioration.

One can demonstrate the same for education. Just as lack of food makes it more difficult for people to absorb education, so the lack of education prevents them from making the best use through proper selection and distribution of the food which they actually have. Just as ill health can undermine schooling or keep children away from school, so lack of schooling can, in turn, prevent families, especially mothers, from coping with health problems of their families, as well as their own, in an efficient way.

Thus, the vicious circle goes round and round. The opposite is of course also true. An improvement in nutrition, *or* health, *or* education, *or* housing, *or* clean water, etc., will in turn, set up beneficial upward, cumulative improvements over the whole range of these basic needs. Hence, the pay-off or "rate of return" for such human investments, is much greater than was previously realised. Our data basis and techniques of measures are still not really adequate to capture the full impact of such pay-offs or rates of returns. But even with imperfect data and techniques, the evidence of such rates of return

on human capital investment through poverty reduction is rapidly accumulating. Much of the evidence is contained in the recent World Development Report, 1980, published by the World Bank. The rates of return calculated in that report on:

“Primary education expenditure are as high as 27% for the low-income countries and those with low literacy rates, compared with 22% for middle-income countries and those with higher adult literacy rates. As the report points out, such returns are rarely equalled by physical investment. The returns on secondary and higher education in developing countries, although lower than for primary education, are still very respectable, and up to 17% higher than those in developed countries.”¹

The evidence has become convincing enough to move the BN approach with its impact on human capital out of the realm of humanitarian or “social” development strategy, and persuade hard-headed “practical” business organizations, such as the World Bank, to make it also the basis of recommended economic strategies and base their own lending policy also increasingly on this approach. In a sense, this is a natural development for an organization which has emphasized from the beginning the importance of development “infrastructure”. The development infrastructure was originally rather narrowly defined as transport, power and irrigation, but it is now increasingly broadened to envelope the whole “human infrastructure” as essential for development.¹

The emphasis on human capital also naturally shifts our particular interest to the problems of children. This is so for a number of reasons:

1. Most obviously, the children of today are the human production capital of tomorrow. Any long-term policy of human investment or human capital formation must start with today's children.
2. Children are a particularly vulnerable group. Malnutrition among children has more devastating and more irreversible and more long-term effects on the future productivity of children, than is the case with adults. The same is true of ill health and other aspects of poverty.
3. Children are always poorer than the adult population. This is so partly because the birth rate tends to be negatively correlated with income levels; poorer people tend to have more children than better-off people. Another reason is that large families are themselves one of the major causes of poverty in developing countries, since children add to consumption and prevent mothers from working without themselves contributing fully to production. As a rule of thumb, one can say that in any develo-

¹ Another sign of recognition of this approach may be seen in the recent award of the Nobel Prize in Economics to Professor T. W. Schultz of Chicago, a leading analyst and advocate of the human approach to development.

ping country, if a poverty line is drawn in such a way that 15 per cent of the total population are below the line, it will be found that about 30 per cent of the children are below the line.

4. There is also a problem of income distribution within families. Where food is short it is almost inevitable that it should be concentrated on the adults, especially on the male adult income earner, on whose fitness the survival of the whole family depends. This maldistribution is often reinforced by ignorance about the special requirements of children, e.g. higher proportions of protein and certain vitamins in their diet, as compared with overall calories.

It is one of the paradoxes and problems of life that those groups of the population which are particularly important to the long-term future of a country, and which are also particularly fragile and vulnerable and in need of human investment – i.e. the children – are also those most exposed to the vicious circles of poverty, and the destruction of human capital which goes with it.

Among children, very special importance attaches to pre-school children for the first four years of their life, i.e. approximately from conception to about 3 to 3½ years of age. The formation of the human brain is a process of protein synthesis: 90 per cent of the total brain (as measured by the number of brain cells) is completed by 3 to 3½ years. Any failure in diet, clean water, failure to utilize food due to parasites, infections or other symptoms of ill health, runs a great risk of retarding brain development. This may easily become irreversible, even with better nutrition in later life.

Once again life makes things more difficult: the children which need help most, are the pre-school children – but this is also precisely the group which is most difficult to reach, except through their mothers and within the context of their families. For example child feeding schemes are often concentrated on school children which can be reached at school. While no doubt school feeding can be very useful in improving attendance, relieving family budgets, improving health, etc., yet the group most in need, the pre-school children, can only be reached through mother/child health clinics and other institutions, where access may be limited, and those in need may be excluded. Even in the case of school feeding in countries where attendance is only partial, this may reach mainly the better-off children and eliminate the poorer children who are not at school. It may also favour the urban children who are more easily reached than rural children.

All this illustrates the difficulties of action to support human capital formation, directed towards those most in need. This is not an argument for abandoning such action, but rather for intense efforts to reach the real target groups.

The advantages of economic development firmly based on widespread

human capital formation can be illustrated by the example of South Korea. In 1953, after Japanese colonisation, the world war and then a devastating civil war, Korea was one of the poorest countries in the world and its prospects would have been rated very low in the light of the H-D model, in view of a very limited domestic saving/investment capacity. However, Korea had the great advantage of tremendous emphasis on education and the welfare of children generally in the Confucian tradition, and also a comparatively modest birthrate. Even as a desperately poor country, South Korea had a network of health services, compulsory education, relatively low child mortality, etc. In the rural areas, poverty was reduced by equal access to land, through successive waves of land reform imposed first by the Japanese then by the Americans, and then enforced by the upheavals of the Korean war. This meant very equal rural income distribution. The high level of human skills – relative to the extremely low income levels – enabled Korea to concentrate on highly labour-intensive technology of export production. In this way, both employment and equality of income distribution were combined with rapid economic growth.

This system served Korea very well, until the mid-70s, when under the pressure of high oil prices and the shift into more capital-intensive technology, strains were beginning to show in what was, until then, a highly successful development performance, bringing Korea to the threshold of industrialized country status. Although no doubt other factors helped – in particular the inflow of US aid and Japanese reparations – the basic element in this successful performance was the formation of human capital *prior to* the big push in economic growth.

In countries where rapid economic growth was not based on *prior* human capital formation, such as Brazil and Mexico, economic development proceeded with much greater social and political strains and was accompanied by increasing polarisation of income distribution and increasing poverty. In South Korea by contrast, poverty was sharply reduced during the 1953 to 1975 period.

The Korean case shows that equal income distribution and emphasis on human capital formation are by no means incompatible with rapid economic growth. This statement could be generalized; the World Bank's *World Development Report, 1980*, has shown that there is a positive correlation between equality of income distribution and the growth rate of GNP.² To quote from the summary of this article:

“The general finding is that countries which had done well on basic needs in 1960 had above average growth rates during the period 1960-1973. Improvement in basic needs during the period are also

²The same point is also made and amply illustrated by Hicks (1979).

correlated with higher growth rates of GNP, but it is impossible to ascertain if this improvement is a cause of or an effect of the higher growth in output.”

If the H-D model were correct and universally valid, we would of course have to expect a *negative* correlation between income equality and rate of growth.

It should be emphasized that the validity of the BN model stressing the reduction of poverty as a primary development objective, is not dependent on this finding that human capital formation also benefits economic growth; but the two together of course powerfully reinforce each other. The H-D development strategy based upon physical investment as primary, can easily result in failure if, for one reason or another, the physical projects turn out to be white elephants. The development strategy of reducing poverty under the BN model may also fail in turning the welfare improvements into human capital and thus produce a rapid rate of growth. But if it fails in this second objective, there still remains the human welfare benefits of such a strategy. That children should survive rather than die young; people should be healthy rather than ill; people should be literate rather than illiterate; that people should be satisfied rather than hungry — all this is surely an advantage in itself. The subsequent speeding up in the rate of growth could then be considered a special bonus, which even if absent, would provide the additional resources to maintain the welfare improvement on a self-sustaining cumulative basis. If absent, the gains will be endangered and the strategy would need re-thinking.

A good example of this “double benefit” is provided by the dramatic increases in life expectancy, which have occurred in nearly all developing countries in the last 15 to 20 years, generally of the order of magnitude of an additional 10 to 15 years of life — a 40 per cent increase. This increase in life expectancy has the obvious effect of making investments in education and training, as well as health improvements. More production, the pay-off in terms of increased output is increased by the fact that more people can look forward to completing a full working life. It also means that parents whose objective it is to have say two sons surviving to their old age to look after them, can safely reduce the total number of children, since they can be more confident that their children will survive. Thus, the increase in life expectancy, itself the result of better health, better education, etc., in its turn provides a basis for further human investment and improvements, i.e. it lowers C/O, raising the productivity of physical, as well as human investment.

The pyramid of human investment is in the training and contribution of scientists, research workers and other high-level professionals of various kinds. This part of human investment is known as R & D — Research and Development. Industrial countries spend some 3 to 5 per cent of their high

GNP on R & D, although much of it is economically wasted by being devoted to military purposes. These figures include the large R & D infrastructure – equipment of research laboratories, etc., – but not higher education in general. The corresponding percentage of the much lower GNPs of developing countries spent on R & D is more of the order of 0.3 to 0.5 per cent even in the better-off countries, although slowly rising. The United Nations has established a target figure of 1 per cent of GNP.³

One of the main problems for developing countries is the brain drain of their highly qualified people: the “external” brain drain relating to the actual migration of such people while the “internal” brain drain relates to the scientists, etc., working on problems of interest to the scientific community in industrial countries, rather than of direct value to their own countries.

The Brandt Report⁴ does not have anything new to say about human investment in general, except in one respect. That is its emphasis on the participation of people in development and decentralisation of development activities which also requires much better organisation of people, particularly of poorer people and people in rural areas.⁵ This is indeed an essential aspect of human investment. It requires organisation and participation to mobilise the latent entrepreneurship in developing countries. Once this is successfully achieved, the pay-off in terms of GNP growth and reduced poverty can be very high. Small farmers, properly supported and given land, water and access to other inputs are much more productive, in terms of output per acre, than big mechanized farmers. Similarly, properly trained and equipped small producers in the urban informal sector, achieve much higher rates of return on the small amounts of physical capital which they use, than large mechanized farms. This was of course the basis of E.F. Schumacher’s famous “small is beautiful”.

When T. W. Schultz, previously mentioned as one of the pioneers of the human capital approach to development, delivered his recent Nobel lecture in Stockholm, he concluded with a quotation from Alfred Marshall, which indeed contains the essence of the human capital approach. Alfred Marshall, wrote “Knowledge is the most powerful engine of production; it enables us to subdue Nature and satisfy our wants”.

*Institute of Development Studies
University of Sussex*

³This was based on the proposals of the “Sussex Group” on science and technology under the chairmanship of the present author which also recommended other targets for direct aid from industrial to developing countries in R & D and efforts in advanced countries for developing countries in R & D. See United Nations (1970, pp. 18-46).

⁴See Brandt (1980).

⁵Op. cit., p. 133.

References

Hicks, Norman L., 1979, Growth vs. basic needs: Is there a trade-off ?,
World Development, 7: 985-994.

Brandt, W., 1980, North-South: A programme for survival, London and
Sydney: Pan Books.

United Nations, 1970, Science and technology for development, New York.