NATIONAL INCOME, INVESTMENT, AND NATIONAL DEVELOPMENT*

By P. C. MAHALANOBIS, F.R.S.

1. The gross national product of any country is the total value of all final goods and services produced in any given year together with provision for the consumption of capital assets. The provision for consumption of capital must be used for the repair and replacement of all real physical assets (lands, factories, machinery, buildings, transport and communications etc.) in order to keep intact the total wealth or means of production. Unless this is done the national product would inevitably fall off. Subtracting the amount required for making good the wear and tear of the real physical assets (usually called the depreciation) from the gross national product one gets the net national product or income and the average share of each person is the per capita net national income. The value of the net national income in India is at present something like 9,000 crores of rupees or Rs. 90 *abja* (one abja=100 crores =one milliard=one billion=10^9). Dividing by the total population of 36 crores (=360 millions), the per capita national income is about Rs. 250 per year. These are not exact estimates but will be used as convenient dimensional figures in round numbers for purposes of numerical illustrations.

2. The net national product or income is thus the total value of goods and services which is available for consumption or for the creation of new physical assets. Economic development means increasing the total net production of goods and services. The increase must also not only keep pace with the growth of population but must be at an appreciably faster rate in order that the average share of each individual, that is, the per capita net national income (η) may increase from year to year.

3. The national income may, of course, be increased to some extent by an increase in the average productivity per person. But the only long range way of increasing the national income is to create new physical assets,

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i.e., new means of production in the form of factories, machines, buildings, transport etc. The rate of economic development would, therefore, ultimately depend on the amount of new physical assets or means of production which is created every year, that is, on the proportion of the net national income which is not consumed but is set apart for investment or capital formation in real physical assets for future production.

4. The rate of such net new investment (which may be called α) in highly industrialised countries like the U.S.A., the U.K., Sweden and Switzerland during the last generation or two, appears to have been something between one-tenth and one-eighth (that is, between, say, 10 per cent and 13 per cent) of the net national product. The rate of net investment or new capital formation, of course, fluctuates from year to year but the average rate over a large number of years is fairly steady. In the U.K. during the period 1870-1913 the rate of net investment was 10.8 per cent per year; and its value exceeded 15 per cent and was 15.2 per cent only once in 44 years. In the U.S.A. the average rate of new capital formation was 12 or 13 per cent over several decades and exceeded 16 per cent over a decennial period only on two occasions during the period 1879-1948. In Sweden the rate over a long period before the war was about 11 per cent; and during the post-war period about 13 per cent. In Switzerland in recent years it has been probably something like 10 or 11 per cent. The rate of net investment in India is not known accurately, but one may perhaps adopt something like 5 per cent or so of the net national product, or roughly about Rs. 450 or Rs. 500 crores in round figures per year for purposes of numerical illustration. This is roughly half or less than half the rate of investment in the industrially advanced countries mentioned above.

5. There is a second important factor, namely, the addition to the national product which is generated, on an average, per unit of the net new investment. This may be called (β) the national income coefficient of net investment. From rough calculations it seems that the numerical value of this coefficient was roughly between one-fifth and one-third (that is, between, say, 20 and 33 per cent) in the above 4 countries during the period under review.

6. It must be emphasized that the income coefficient of investment (β) is not something like the financial return or profit on investments in individual enterprises. For example, an iron and steel plant may give a dividend of 5 or 6 per cent to the owners or share-holders. The value generated or added to the national income at the plant would be much greater, possibly 12 or 14 per cent. In light engineering or in agricul-

ture, the value generated by one unit of investment would be still higher and the income coefficient of investment may be 50 per cent or even 100 per cent in particular sectors, so that the average income coefficient of investment for the whole national economy may have a value of the order of 20 or 30 per cent. A second point is also of great importance, namely, that the total increase in the national income due to new investment is scattered over the whole of the national economy and cannot, therefore, be segregated in any way except in so far as the additional income (at the level of business profits) accrues to the socialized sector of the national economy.

7. The rate of investment (α) and the national income coefficient of investment (β) would naturally fluctuate from time to time depending on the pattern of investment, but it is not improbable that over a number of years their average values would remain fairly stable. Thus both the rate of investment (α) and the income coefficient of investment (ρ) may perhaps be treated, over a number of years, as characteristic parameters of a particular economic system.

8. The numerical values of the rate of investment (α) and the income coefficient of investment (β) given above are admittedly rough but can be used to make illustrative calculations of the rate of increase of national income (γ) which is given simply by multiplying together these two figures (that is, $\alpha\beta$). For example, in the U.S.A. the average rate of net investment (α) during the period 1861-1938 was about 12 or 13 per cent; and the average income coefficient of investment (β) was about 30 or 33 per cent. Multiplying the two (α and β) together one gets from 3.6 per cent to 4 per cent or say 3.8 per cent as the average rate of increase of net national income (γ) in the U.S.A.

9. It is also necessary to make allowances for the rate of increase of population (which may be called ρ). Population in the U.S.A. was growing at an average rate of roughly 2 per cent during the period 1861-1938. Subtracting 2 per cent ($=\rho$) from 3.8 per cent ($=\gamma=$rate of increase of net national income) one gets the rate of increase of the per capita net national income per year, (that is, $\eta=\alpha\beta-\rho$). This agrees reasonably well with an observed rate of 1.9 per cent per year over the same period. It will be noticed that if the three coefficients (α, β and ρ) remain reasonably constant then the per capita net national income would increase in accordance with the rule of compound interest (that is, $\eta_t=\eta_0 (1+\alpha\beta-\rho)^t$, after t years).

10. Some fairly reliable material is also available for the United Kingdom for the period 1870-1913. The rate of net investment (α) was

about 10.8 per cent and the coefficient of net investment (β) about 22 per cent. Multiplying together the two figures, one gets 2.38 per cent as the average rate of increase of net national income per year (γ) and subtracting the rate of increase of population (ρ) of 0.95 per cent per year (arithmetic average of the decennial increases) one gets 1.43 per cent per year against an observed value of 1.34 per cent per year, over the period under review. The agreement is, again, not unsatisfactory. In the case of Sweden and Switzerland also the numerical values show broadly similar features.

11. The value of the national income coefficient of net investment (β) in India is not known. But assuming that it is as high as 30 or 33 per cent (as in the U.S.A.), and also assuming that the rate of net investment (α) is about 5 per cent, the growth in total national income would be something of the order of one-and-a-quarter (1.25) or one-and-a-half (1.5) of one per cent per year. Population is growing at present roughly at the rate of one-and-a-quarter per cent (1.25%). Subtracting 1.25 per cent from the rate of increase of total net national income (1.25 or 1.5 per cent), the rate of increase of per capita net national income comes out as practically nil or about one-fourth of one per cent ($\frac{1}{4}$%) per year. This would seem to indicate that there has not been any deterioration in the national economy but the per capita net national income in India has probably remained more or less stationary or is growing at a very slow rate. This is in keeping with general impressions.

12. If it is desired to double the per capita income in India in, say, 35 years (with population continuing to grow at the present rate) then the per capita net national income must increase at the rate of 2 per cent per year, and the total net national income must increase at the rate of at least three-and-a-quarter per cent ($3\frac{1}{4}$%) per year. To attain this rate of growth it would be necessary to make new investments at the rate of something like 10 or 11 per cent of the net income per year, that is, the rate of investment must be roughly of the order of Rs. 900 or Rs. 1,000 crores per year. This means that there must be additional investments to the extent of something like Rs. 400 or Rs. 500 crores per year over and above what is being invested at present. The figures given above are, of course, extremely rough and are only dimensional in nature. In fact, the approach in the present discussion has been definitely of the type of operation research, and numerical values have been given primarily with a view to indicating the magnitude of the quantities involved in national development in India.

DISCUSSION

[*Note*—The lecture was followed by a discussion during which the speaker was asked whether he had made any study of the position in socialized economies. He replied that he had collected some fragmentary information about Poland, Czechoslovakia, Hungary, East Germany and U.S.S.R. which, as time was short, he thought might be discussed more conveniently on another occasion. As he received many subsequent enquiries on this point he sent a brief note on 6th October, 1952, which is given below.]

In socialized economies the rate of net investment (α) is stated to be definitely higher and possibly of the order of something like 15 or 16 per cent or more. The income coefficient of investment (β) also appears to have a much higher value namely, of the order of 50 or 60 per cent or even more so that the rate of economic development (as measured by the increase in the per capita net national income) would be much faster under socialized production. If the claims made by the socialized countries are substantially correct then there would seem to be three distinct bands of economic development. One with a rate of new investment of 5 or 6 per cent as in pre-industrial countries like India; another with a rate of investment of from 10 to 12 per cent (or nearly double that of the first level) as in West Europe and the U.S.A.; and the third with a rate of investment of roughly from 15 to 18 per cent (or three times that of the first level) as in socialized countries. The income coefficient of investment (β) also may have two broad levels of value, namely, something between 15 or 20 and 33 per cent in capitalistic or mixed economies and roughly twice as high or more under socialized production. It is also possible that there is a still lower level of development in purely agricultural countries in which economic conditions remain stationary, and net national income can increase only by bringing new lands under cultivation. There is no doubt that the above account gives an extremely oversimplified picture. It is being presented here merely to indicate possible trends of economic development and to draw attention to the need of a careful study of these problems in connexion with national planning in India.