



The Measurement of Real Income

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THE MEASUREMENT OF REAL INCOME

THE remarks by Mr. Keynes on my paper on "The Measurement of Real Income," in the JOURNAL, March 1940, p. 62, text and footnote, show, I think, some misconception of the basis and content of the formulæ I gave.

Ignoring the transfer of income to pensioners, etc., we have L_1 , L_2 , L_3 income arising from production in three groups of quantities M_1 , M_2 , M_3 .

The suffix (1) refers to goods produced for the open market that are not taxed, (2) to goods subject to tax on sale, (3) to production for the Central or Local Governments.

The yield from indirect taxation is written $E = L_2T$. When we come to assigning prices for the purpose of a price index-number, it is taken that E is used in reducing prices of the third group, so that its contribution to the index is L_3R , instead of L_3 , where $E = L_3(1 - R)$; i.e. $L_2T + L_3R = L_3$.

The income based on a Census of Production is then :—

$$K = L_1 + L_2(1 + T) + L_3R = L_1 + L_2 + L_3,$$

the last expression being income as the aggregate of individual incomes.

Using small letters to represent the quantities in another year, we have :—

$$k = l_1 + l_2(1 + t) + l_3r = l_1 + l_2 + l_3.$$

The prices per unit quantity are to be taken as

$$L_1/M_1, L_2/M_2 \cdot (1 + T), L_3/M_3 \cdot R.$$

The price index-numbers are :—

$$I_1 = \frac{M_1 \cdot l_1/m_1 + M_2 \cdot l_2/m_2(1 + t) + M_3 \cdot l_3/m_3 \cdot r}{M_1 \cdot L_1/M_1 + M_2 \cdot L_2/M_2(1 + T) + M_3 \cdot L_3/M_3 \cdot R}$$

and

$$I_2 = \frac{m_1 \cdot l_1/m_1 + m_2 \cdot l_2/m_2(1 + t) + m_3 \cdot l_3/m_3 \cdot r}{m_1 L_1/M_1 + m_2 L_2/M_2(1 + T) + m_3 \cdot L_3/M_3 \cdot R}$$

The denominator of $I_1 = K$, and the numerator of $I_2 = k$.

Then the index of real income, that is the index of production, is either

$$J_2 = k/K \div I_1 = \frac{l_1 + l_2(1 + t) + l_3 \cdot r}{l_1 \cdot M_1/m_1 + l_2(1 + t) \cdot M_2/m_2 + l_3r \cdot M_3/m_3}$$

or

$$J_1 = k/K \div I_2 = \frac{L_1 \cdot m_1/M_1 + L_2 \cdot (1 + T) \cdot m_2/M_2 + L_3 \cdot R \cdot m_3/M_3}{L_1 + L_2(1 + T) + L_3R.}$$

In other treatments it has been usual to include the value of

Government goods at cost price without any argument that justifies that price. In my paper I gave reasons for the method here described. To reach Mr. Clark's method we must put $R = 1 = r$ throughout, and this, in my opinion, involves double counting; for the yield of indirect taxation is included in the value of the taxed goods and not excluded from that of subsidised or free goods, with the result that the value of total production exceeds the aggregate incomes of the producers.

A. L. BOWLEY

Prof. Bowley is right that I had not understood the exact character of his argument, for which I apologise. But I remain considerably perplexed, especially about his criticism of Mr. Colin Clark in the last paragraph above.

Mr. Clark does not claim that $L_1 + L_2(1 + T) + L_3$ (in Prof. Bowley's notation) is equal to the aggregate incomes of the producers. His point is that this is the money sum which has to be deflated in order to yield real income if one uses a normal index number in which taxed commodities are taken at market price, including tax, and Government services, are valued at cost. Does Prof. Bowley deny this?

I appreciate that Prof. Bowley argues that Government services, whether central or local, *should* not be valued at cost, but at cost less the yield of indirect taxes (which would seem to be an easier concept for the aggregate of Government services than for a particular one, such as cleaning the streets—it is a paradox that the value put on cleaning the streets depends on whether taxes are direct or indirect), and that if we use an index number which prices Government services according to this scheme, it is a different money sum from the above—namely, with L_3R substituted for L_3 , which has to be deflated to yield real income. But may I ask him whether the amount of real income on this formula does not depend on whether taxes are direct or indirect? For example,

$$\text{if all taxes are indirect, } J_2 = \frac{l_1 + l_2 + l_3}{l_1 \frac{M_1}{m_1} + l_2 \frac{M_2}{m_2} + l_3 \frac{M_2}{m_2}}.$$

$$\text{But if all taxes are direct } J_2 = \frac{l_1 + l_2 + l_3}{l_1 \frac{M_1}{m_1} + l_2 \frac{M_2}{m_2} + l_3 \frac{M_3}{m_3}}.$$

Is this correct? If so, it seems an awkward consequence.

J. M. KEYNES

No. It is a natural consequence if there is a change of numbers in the classes.

$$J_2 \text{ indirect} < J_2 \text{ direct, if } \frac{M_2}{m_2} > \frac{M_3}{m_3}$$

$$\text{if } \frac{N_2 Q_2}{n_2 q_2} > \frac{N_3 Q_3}{n_3 q_3}.$$

Take change of output per head the same in the two classes, i.e.

$$\frac{Q_2}{q_2} = \frac{Q_3}{q_3},$$

then J_2 indirect $<$ J_2 direct, if $\frac{N_2}{n_2} > \frac{N_3}{n_3}$.

Suppose a transfer of v persons from Class 2 to Class 3,

the condition is then $\frac{N_2}{N_2 - v} > \frac{N_3}{n_3 + v}$, which is the case if $v > 0$.

If no transfer, $v = 0$, and the measurements are the same, unless there is a change in relative efficiency, i.e. $\frac{Q_2}{q_2} \neq \frac{Q_3}{q_3}$.

I do not deny that Mr. Clark's index number is right for his conception of income.

A. L. BOWLEY

OFFICIAL PAPERS

*The Distribution of the Industrial Population.*¹

As is emphasised in a preliminary note, the Report was completed just before the outbreak of war. In present circumstances it is to be expected not only that the recommendations of the Commission will be left on one side till a later day, but also that some of its findings, and the material on which they are based, will be somewhat irrelevant to the new situation. Thus, to take only the most striking example, the Commission was asked to consider the implications of air attack on industrial location; of necessity this had to be done without any precise evidence of how great the danger might be, and therefore of how far-reaching its implications would become, and thus it occupies a secondary position in the Report. To-day, however, this factor has become one of primary importance, overriding all others.

It would, however, obviously be wrong to dismiss the whole

¹ The Report of the Royal Commission on the Distribution of the Industrial Population; Cmd. 6153. (H.M. Stationery Office, 1940. Pp. x + 320. 5s.)