Zeitschrift für Nationalökonomie, vol.7, n°3, 1936

Mr. Keynes' Theory of the "Multiplier"

A Methodological Criticism

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I.

According to Mr. Keynes, his analysis of the so-called "multiplier" is "an integral part" „of his General Theory of Employment" (p. 113). This multiplier, k, "establishes a precise relationship, given the propensity to consume, between aggregate employment and income and the rate of investment" (p. 113). "It tells us that, when there is an increment of aggregate investment, income will increase by an amount which is k times the increment of investment" (p. 115). "Before coming to the multiplier" Keynes introduces "the conception of marginal propensity to consume" (p. 114). He calls Y_w income in terms of wage units, C_w and I_w are consumption and investment respectively also in terms of wage units. For our purpose it is not necessary to go into the choice of the units — a matter which Keynes discusses carefully. He points out that changes in Y_w must not be identified with changes in income in terms of product and with changes in employment. "The fact that they always increase and decrease together", however, makes it, in certain contexts, possible "to regard income in terms of wage-units as an adequate working index of changes in real income" and in employment (p. 114). Since our argument is independent of the unit, we may accept Keynes' choice and in the following discussion use the symbols Y, C and I alone without the subscript w.

Keynes assumes that "when the real income of the community increases and decreases, its consumption will increase and decrease, but not so fast" (p. 114). That is to say, ΔC and ΔY have the same sign, but $\Delta Y > \Delta C$. The marginal propensity to consume is defined as $\frac{\Delta C}{\Delta Y}$. If, e. g., the marginal propensity to consume is $\frac{9}{10}$, that means that $\frac{9}{10}$ of a small increment of income will be consumed. If it is 1 the whole increment will be consumed, if it is zero the whole will be saved.

"This quantity (the marginal propensity to consume) is of considerable importance, because it tells us how the next increment of output will have to be divided between consumtion and investment" (p. 115). Now,

$$\Delta Y = \Delta C + \Delta I$$
$$= \frac{1}{1 - \frac{\Delta C}{\Delta Y}} \cdot \Delta I$$

$\frac{1}{1 - \frac{\Delta C}{\Delta Y}}$ is, by definition, the multiplier, k.

Or $1 - \frac{1}{k}$ is, by definition, the marginal propensity to consume (p. 115).

It follows that if e. g. the marginal propensity to consume is $\frac{9}{10}$ the multiplier is 10; "and the total employment caused (e. g.) by public works will be ten times the primary employment provided by the public works themselves, assuming no reduction of investment in other directions" (p. 116/117). This result is clearly implied by the assumption: if we assume that an increment in Y is divided in the proportion of 1 : 9 between I and C, then we assume that an increase in I by X units will mean an increase of 9 X in C and an increase of 10 X in Y. If we assume the marginal propensity to consume to be zero, in other words that an increment in Y is wholly confined to I, then we assume that an increment in I increases Y by no more than its own amount. If the marginal propensity to consume is assumed to be 1, that is if we assume that "the next increment of output will have to be divided between consumption and investment" in the proportion of 1 to 0, then, in order not to contradict this assumption, we must assume that any increase in I is accompanied by an infinite increase in C and Y — we assume the multiplier to be infinity.

II.

We have now to ask, what is gained by this procedure? In reality nothing more than that a new name is given to the multiplier. The multiplier is defined in terms of marginal propensity to consume. Instead of the multiplier we can always say $\frac{1}{1 - \frac{\Delta C}{\Delta Y}}$ and for marginal propensity to consume we can always substitute $1 - \frac{1}{k}$. One and the same thing has got two names.

Now, I do not question that sometimes it may serve a useful purpose to have two names for the same thing, but it seems that Mr. Keynes has fallen into the trap of treating such a relationship by definition as a causal or empirical relationship between investment and income and that thereby a large part of what he says about the multiplier and its probable magnitude is vitiated. By assuming something about the

marginal propensity to consume he assumes something about the multiplier, but this is no more an explanation of the multiplier than pauvreté is an explanation of poverty.

Mr. Keynes has adopted exactly the same procedure in his Treatise on Money in respect to differences between savings and investment. As Professor Hayek and Mr. Hawtrey have emphasised, Mr. Keynes there defines savings and investments in such a way that an excess of savings over investments is identical with an equal amount of losses and an excess of investment over savings is identical with an equal amount of profits, so that for excess saving we can always substitute losses and for excess investment profits. But although he has identified these magnitudes by his definitions, he treats them on numerous occasions as cause and effect by saying that a certain event or measure or factor can cause losses or profits only if and in so far as it leads to excess saving or excess investment. If we insert the definition for these expressions this amounts to saying that certain events will cause losses or profits only if and in so far as they lead to losses or profits.

This mistake of treating relationships by definition as causal relationships occurs rather frequently in economics[1]), not only in Cambridge, so that it might be useful to analyse the multiplier case, which constitutes an interesting specimen of this fallacy, a little further.

III.

The problem was originally to get a quantitative idea about the secondary effects of a certain piece of investment on employment and income. If the Government spends a hundred millions on road construction and employs thereby directly and indirectly a certain number of workers, how large will be the secondary effect? This is certainly a very important question and since it is impossible to estimate the secondary effect offhand, the problem must be closely analysed and various cases distinguished[2]).

Now Keynes approaches the problem by means of a terminological roundabout way, that is to say, by giving the magnitude in which we are interested another name. He expresses the multiplier in terms of

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[1]) The general aspects of methodology are discussed by F. Kaufmann, Methodenlehre der Sozialwissenschaften, Vienna 1935, pp. 32, 43, 48, 257. See also his article "On the Subject-Matter and Method of Economic Science" in Economica, November 1933, p. 387 et seq.

[2]) Mr. Kahn stated the problem clearly in his well known article in the Economic Journal. For a theoretically correct and at the same time realistic discussion of the factors on which the result depends, see J. M. Clark, Economics of Planning Public Works (1935), p. 80 and seq. and E. R. Walker's illuminating article "Public Works as a Recovery Measure" in The Economic Record, Vol. XI, Dec. 1935. See also M. Mitnitzky, "The Effects of a Public Works Policy on Business Activity and Employment" International Labour Review XXX (1934), and H. Neisser, "Secondary Employment: Some Comments on R. F. Kahn's Formula" in Review of Economic Statistics. Vol. 18, 1936.

marginal propensity to consume and treats the latter as if it were a thing in the real world which is independent from the former, whilst in fact the two are closely connected by definition — so closely indeed that the author himself on one occasion forgets that they are conceptually not the same and treats them by mistake as synonyms (p. 123 and erratum on p. 403).

I still believe in the superiority of longer over shorter roundabout ways of production of concrete goods, but I am highly suspicious of terminological roundabout ways in the construction of theories. They cannot always be avoided, but they are dangerous, and in the case under review the verbal roundabout method has led to a confusing terminological duplication.

This criticism will be contested. Probably it will be urged that the deprecated roundabout way proves to be fruitful, since it is possible to make, on the basis of psychological observations of a general nature, a number of statements about the approximate magnitude of the marginal propensity to consume — statements which cannot be made directly about the multiplier. To confirm this, chapters 8 and 9 may be pointed to, where Keynes discusses in detail the objective and subjective factors which influence the propensity to consume. I do not question either the validity or the usefulness of these observations, and I readily agree that these psychological considerations do not apply except very indirectly to the multiplier and that therefore, if they are to be used in determining the multiplier, a bridge must be constructed to link them to it. There is, however, this difficulty. If we really can, on the basis of psychological considerations, guess in what proportions an increment in Y, however brought about, will be divided between C and I, we do *ipso facto* estimate the proportion by which an increment in I will increase Y. If we say something about the marginal propensity to consume, we say thereby something about the multiplier. The premise that we can say something on the basis of such psychological considerations about the propensity to consume sounds very plausible: the inference that the multiplier too can be completely determined by such familiar psychological considerations is manifestly precarious. This strongly suggests that something is rotten in the State of Denmark! It is not very difficult to see what is wrong. Keynes has in fact two different concepts of propensity to consume. In his arithmetics he uses it in the formal sense which we have discussed; in this sense it is by definition directly related to, and is another aspect of, the multiplier. In the chapters 8 and 9 where he discusses on what circumstances depends the proportion of a man's income which he spends onconsumption, he speaks of the marginal propensity to consume in the ordinary or "psychological" sense without realising that this is an entirely different thing. About the latter, we can, of course, make generalizations on the basis of our everyday experience derived from our own attitude towards increases in income and our observations of the behaviour of other people in this respect under various attendant circumstances. But from this

the multiplier cannot be directly deduced. Keynes achieves this deduction only by substituting the propensity to consume in the formal sense for the propensity to consume in the ordinary sense. In other words, he now uses the same word for two entirely different things having previously bestowed two words upon the same thing. His terminology exemplifies the paradox of poverty in the midst of plenty.

It is easy to see that marginal propensity to consume in the formal sense, that is $1-\frac{1}{k}$, is not the same thing as marginal propensity to consume in the ordinary sense. Suppose the latter is unity, that is to say, people spend all their additional income on consumption. What, under this assumption, will be the secondary effects of public works? What will be the multiplier, that is $\frac{1}{1-\frac{\Delta C}{\Delta Y}}$? Will the multiplier necessarily be infinite and the marginal propensity to consume in the formal sense unity? Not at all! How it works out, in the end, depends on many other circumstances, a number of which have been treated by Keynes himself and by Kahn, and especially by J. M. Clark and E. R. Walker. It depends on the leakages discussed by Mr. Kahn[1]); on the time which is allowed to elapse; on the effects of the primary investment on other investment, that is, in the terminology of Mr. Keynes, on the marginal efficiency of capital[2]); on the velocity, especially the income velocity of money. If we say that according to our psychological experience people spend a certain proportion or the whole of their income on consumption, we do not mean that they spend it instantaneously, we mean that they spend it during the income period as fixed by the habits of payment. A multiplier of infinity, that is a propensity to consume, in the formal sense, of unity would involve a velocity of circulation of infinity — an absurd consequence which is not involved by the assumption that the propensity to consume in the ordinary sense is unity. For various reasons which I cannot discuss here, I am inclined to believe that usually the secondary effects of public works will be larger, if the marginal propensity to consume, in the ordinary sense, is larger than if it is smaller. There is, however, no close and unique relationship between the marginal propensity to consume in the ordinary

[1]) Some of these leakages, not all, involve the assumption that the propensity to consume in the ordinary sense is less than unity.

[2]) I am aware that Keynes speaks of net changes in aggregate investments in which these secondary investments are to be included. But to assume these secondary investments as given detracts considerably from the value of the theory. This reveals a significant change in the meaning of the multiplier. Originally it was defined as the ratio of the secondary to the primary employment, when the primary employment is that which is required by the production of a concrete piece of investment. Now that the meaning has been changed, we can no longer speak of primary and secondary. This alteration is symptomatic for the transformation of the theory of the multiplier from an empirical statement into a barren identity.

sense (as determined by the objective and subjective factors discussed by Keynes in his chapters 8 and 9) on the one hand, and the multiplier (and the marginal propensity to consume in the formal sense) on the other hand.

It could conceivably be objected that even in chapters 8 and 9 Keynes does not mean marginal propensity to consume in the ordinary sense, but that in the formal sense, and this objection could be corroborated by pointing to the definition of marginal propensity to consume at the beginning of chapter 8 (p. 90). If, however, this were the case, then the analysis of the objective and subjective factors determining the marginal propensity to consume is simply besided the point because these factors have clearly no direct bearing on the marginal propensity to consume in the formal sense and, what comes to the same thing, on the multiplier. In that case it also follows that the guesses about the probable magnitude of the marginal propensity to consume (which are erroneously extended to the multiplier), which are based on the analysis of the objective and subjective factors just mentioned, are unsupported and unsubstantiated statements.

An interesting illustration of the state of confusion is afforded by the following statement on p. 117: "An increment of investment in terms of wage-units cannot occur unless the public are prepared to increase their savings in terms of wage units. Ordinarily speaking, the public will not do this unless their aggregate income in terms of wage-units is increasing. Thus their effort to consume a part of their increased incomes will stimulate output until the new level (and distribution) of incomes provides a margin of saving sufficient to correspond to the increased investment. The multiplier tells us by how much their employment has to be increased to yield an increase in real income sufficient to induce them to do the necessary extra saving, and is a function of their psychological propensities." It is not easy to interpret this statement, since we must remember that, according to Keynes' terminology, aggregate (net) saving is by definition equal to aggregate (net) investment. Suppose e. g. that roads are being built by the Government with the value of 100 (wage units) and assume further that there are no repercussions whatsoever on other investment which is Keynes' own assumption (first line p. 117). Then according to Keynes these 100 wage units constitute an addition to total income, investment and savings, all three are being increased by the same amount, whatever happens to consumption. For any net increase in investment constitutes by definition also saving. What is then the sense of saying that income must increase by so and so much in order to induce income-receivers to provide the necessary saving? If we adhere to all the definitions given, the meaning can be only this: On the basis of the objective and subjective factors mentioned above, certain assumptions are arrived at about the actual magnitude of the propensity to consume in the psychological sense. Then the propensity to consume in the formal sense is substituted for the propensity to consume in the psychological

sense. The quantitative estimate about the latter is thereby extended to the multiplier. By now everything is assumed. An increase in investment cannot occur without an increase in aggregate income as determined by the multiplier, not, as Keynes says, because otherwise the public will not be prepared to provide the necessary savings[1]), but because we have assumed that it cannot occur otherwise. The quoted statement turns out to be not an empirical statement which tells us something interesting about the real world, but a purely analytical statement about the consistent use of an arbitrarily chosen terminology — a statement which does not explain anything about reality.

IV.

I do not deny that there are interesting observations and helpful hints in these pages on the multiplier. But they are thrown out incidentally as by-products and are, so to speak, not put in the right perspective. The consequences are rather serious. On p. 118, e. g., in application of the theory, the following statement is made[2]): „In actual fact the marginal propensity to consume seems to lie somewhere between the these two extremes, though much nearer to unity than to zero; with the result that we have, in a sense, the worst of both worlds, fluctuations in employment being considerable and, at the same time, the increment in investment required to produce full employment being too great to be easily handled."

I do not wish to discuss the truth or falsehood of the proposition that, as a rule, under certain circumstances, the secondary effects of increments in investment are such as Mr. Keynes says. It is perhaps possible to demonstrate that our economic world is so organised that the multiplier sometimes works out according to the quoted statement. But Mr. Keynes offers no adequate proof, only a number of rather disconnected observations (which could be used for the construction of an adequate theory). His central theoretical idea about the relationships between the propensity to consume and the multiplier, which is destined to give shape and strength to those observations, turns out to be not an empirical statement which tells us something about the real world, but a barren algebraic relation which no appeal to facts can either confirm or disprove.

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[1]) If there is an additional investment this is in itself, by Keynes own definition, savings and nobody is called upon to provide savings.

[2]) It should be noted that after the theory has thus been applied to practical problems, Mr. Keynes finds it necessary to qualify his theory very severely. But these qualifications are not expressly extended to the applications. This procedure, which is adopted more than once, makes the book very dangerous for the unguarded reader.