

Money Supply and Interest Rate in Recent Macro-Economic Conceptions

I - Introduction.

1. — A tendency still persists, in certain macro-economic conceptions, to hold as a generally valid principle one of the characteristic assumptions of the Keynesian system, which does not, in fact, possess general validity. This can be clearly seen in a recent article in which Prof. Erich Schneider (1) dissents from the opinions I outlined in this « Quarterly Review » (No. 18, July-September 1951) in an article on *Liquidity in the Economy and in the Banking System*, and in a paper *L'offerta di moneta tallone di Achille dei modelli keynesiani*, published by the « Giornale degli Economisti » (July-August 1952).

This article by Prof. Schneider, by virtue of its extreme clarity and concision, makes it possible to focus the point of disagreement and to highlight what, in my opinion, should be removed from these macro-economic conceptions. And we might go further and say that it sheds light on the « error » which lies in them; *i.e.* clarifies its nature, origin and consequences. This is of no mean importance, since attempts are sometimes made to use models based on those conceptions to frame new rules of « programming » for a more effective conduct of economic policy.

II - The Point of Disagreement.

1. — I have already stated what, in my view, is the point to be revised: I feel that it is entirely unwarranted to present unconditionally and in general terms, as certain

under any circumstance, something that can apply only in particular cases, subject to the occurrence of many different conditions.

This can be seen from the manner in which Schneider, after having recalled the « fundamental theorem of the income theory » according to which « with a given propensity to save and invest, the level of the interest rate is the factor which determines the national income » (*loc cit.*, p. 2), goes on to consider how income is affected by the changes in those propensities. Using a set of diagrams, Schneider shows us graphically that:

(a) A greater propensity to invest involves an expansion in income — in fact, an expansion large enough to form the savings needed to support increased investment (Schneider's, Fig. 1), and:

(b) A greater propensity to save involves a reduction in income — in fact, a reduction which is in direct proportion not only to the « level » but also to the « gradient » of the propensity to save (Schneider's, Fig. 3a).

This brings out clearly the most characteristic aspect of the Keynesian system: investment and saving must balance each other at all times, but while the tendency to expand investment leads to a balance through an expansion in income, the tendency to expand saving leads to a balance through a contraction in income. And all this is not presented as something which may occur only under certain circumstances, but as an axiomatic and unconditional necessity in either direction. A greater propensity to invest cannot, by itself, result in anything but an expansion in income, and conversely a greater propensity to save must necessarily, by itself, result in a reduction in income.

(1) E. SCHNEIDER, *Interesse e Quantità di Moneta nella Teoria Economica della Formazione del Reddito* (Interest and Money Supply in the Economic Theory of Income Formation), in « L'industria », 1954, No. 1.

2. — This theoretical system — as stressed by Schneider himself in another paper (2) — « has been shown to be extremely fruitful and applicable to the most differing actual conditions », so that « if we today have a better understanding of the market economy than 20 years ago, and are better equipped against the ups and downs of the trade cycle, we owe this to the theoretical achievements of Keynes ».

But in effect the theoretical apparatus constructed by Keynes has become fruitful only as, and to the extent that, in the labour of « digesting » the Keynesian models, we have learned the real scope of each of these models and hence of the whole system — in other words, as we determined with what qualifications and under what conditions the Keynesian-type models can be applied to widely differing concrete conditions (3). Ultimately, we have come to appreciate that the asserted general validity of those models, seen in their formal aspect as pure analytical tools, does not mean that we should consider valid under all and every circumstance the « theorems » and « corollaries » which are deduced from them and constitute « the flesh and the spirit » of the Keynesian conceptions.

3. — Thus, starting from the « fundamental theorem » in the precise terms formulated by Schneider, it is obvious that it contains an assumption of principle; in that from the relationship

$$S(Y) = I(i) \quad (4)$$

(2) *Fundamental Errors in recent Anti-Keynesian Literature*, published in this « Quarterly Review » (No. 24, January-March 1953).

(3) The results of the research done in this field in Italy are set forth in the volume « *Studi Keynesiani* » (Keynesian Studies), published in 1953 by the Economics and Finance Institute of the Rome Law School, directed by G. Ugo PARI.

(4) This relationship, obviously, is obtained from the well-known equation:

$$Y = C(Y) + I(i)$$

taking:

$$S = Y - C$$

The equation, however, only says that:

$$f(Y, i) = 0$$

from which we can arrive at either of the expressions that follow in the text.

it is inferred that the level of the interest rate is the factor which determines income; i.e. that we must univocally take

$$Y = Y(i)$$

By strict logic, we might on the same basis take

$$i = i(Y)$$

i.e. we might infer from the same relationship that the amount of income is the factor which determines the interest rate.

It would be meaningless to try and determine which expression is more « correct » or more « true ». But we are justified in saying that when we want to show the effects on income of the variations of the interest rate, we should use the expression:

$$Y = Y(i)$$

shaped in appropriate form, while if we want to show the effects of income variations on the interest rate, we should use the expression:

$$i = i(Y)$$

also shaped in appropriate form.

Ultimately, it remains to be seen what can be the real scope of both « effects »: whether in actual fact — e.g. with reference to actual conditions in Italy or Germany in a given period, for instance the years following the Second World War — the movements of the interest rate determined the movements of income, or whether this relationship operated in the reverse direction. In this connection, we must also consider the actual degree of elasticity of the investment curve as a function of the interest rate — in other words, consider the elasticity of the curve of « marginal efficiency » of investments. I discussed this point thoroughly in the aforementioned paper on « The Money Supply », concluding that we should now consider as no longer valid « that essential part of the General Theory, in which so much importance is attributed to interest rate variations as to consider them the basic element for the variations in the aggregates of investments, employment and income ».

4. — It is obvious that we must likewise qualify our statements with regard to the

multiplying effects which expenditure may cause on income (See above, para. II, 1a). In this direction, considerable progress has been made through the plentiful literature on the « multiplier », which in substance has thrown more and more light on the limitations of validity of the original Keynesian formulation, particularly in respect to the formation of real income.

A similar need, arises with respect to the opposite depressive effects which may be caused by saving (See above, para. II, 1b). This is the point of my disagreement with Prof. Schneider, who, in effect, refuses to acknowledge the existence of the limitations of validity which I believe to be inherent in the Keynesian conception, with respect precisely to the depressive effects of saving and of liquidity preference.

In this sense I explained (particularly in the paper on « Liquidity », I, 6) how the savings of a single individual, insofar as they are hoarded, may cause regressive involutions in income, to such an extent that hoarded savings may be considered as a loss of income for the community. In fact I stressed that this can occur by ways other than those indicated by Keynes: even apart from the asserted impossibility of a lowering of the level of the interest rate. At the same time, however, I indicated (same paper, I, 7-14) how effects of this kind may actually occur in periods of recession or stagnation, rather than in periods of normal development or uninterrupted expansion of the general economic activity. And I drew the conclusion (in the paper on *L'offerta di moneta etc.*, IV, 1) that the Keynesian schemes, particularly as regards the effects of saving on income, « while they provide us with much more effective tools to be used in appreciating the problems of depressions and, in general, of business fluctuations, connected with the variations in income derived from existing resources, they certainly do not provide suitable tools for an understanding of the development problems connected with the progressive expansion in potential resources ». Schneider takes issue with this conclusion: he believes that « the Keynes model cannot be said to apply only in conditions of recession » (p. 12).

5. — Schneider maintains, therefore, that those parts of the Keynesian system which lead to denying the existence of a continuing connection between individual acts of saving and investments as a whole, are valid under all circumstances, and not only in conditions of recession. More precisely, Schneider also claims that such a connection would fail, without a *deliberate* action on the part of the monetary authorities, at any stage of development and of the business cycle: it would fail, in the absence of that deliberate action, whenever savings, not directly invested by the saver, take place in monetary form through the banking system.

According to Schneider, « increased savings in the form of hoarding of cash or deposits act rather as a check on the Banks' lending ability » (p. 11). And for this very reason, Schneider further asserts that saving by itself involves, under any circumstance, that income-depressing effect which is so much emphasized in the Keynesian doctrine. This depressing effect could « be counterbalanced only by a corresponding increase in investments » (p. 12), which in its turn could be brought about « only by deliberate action on the part of the monetary authorities » (p. 10). According to Schneider, « only the Central Bank determines the extent to which credits can be granted » (ibidem) by the banking system as a whole.

Schneider infers from this that « there is no doubt of the truth of Keynes' argument » that money (including bank deposits) « has a zero or at any rate very small elasticity of production, so far as the power of private enterprise is concerned, as distinct from the monetary authority » (p. 11). Schneider, therefore, refuses to admit that the amount of money lent by the banking system as a whole can depend upon « private enterprise » — that it can depend also upon the behaviour of the public as creditor of the banking system. And here, in the last analysis, lies the point of disagreement, or, more precisely, its basic *raison d'être*.

6. — In my view, as quoted by Schneider himself, « if the creation of credit money requires an increase in the total amount lent

by the banking system, it likewise requires that the public as a whole be willing to increase its assets kept in monetary form» (p. 11); in other words, that the public be willing to extend credit to the banks against the credit extended to it by the banks.

As I see it, therefore, increased saving in the form of hoarding of deposits should not be likened to the hoarding of cash: increased deposits or, to put it more exactly, the tendency of the public to extend more credit to the banks, do not act as a check, but rather as a stimulus to the Banks' lending potential. This means that saving, even if in the form of bank deposits, does not automatically exert an income-depressing influence, because the greater demand for bank deposits, acting as a stimulus towards additional bank lending, induces by itself a greater supply of money in the form of deposits. More precisely, while in periods of normal development or uninterrupted economic expansion the impetus given by the public to the creation of deposits actually translates itself into a greater supply of money in the form of deposits, because under those circumstances the other elements concurring in their creation act in the same direction (or are «neutral»), in periods of recession or stagnation that impetus becomes ineffective, lacking the concurrence of the other factors (as explained in detail in the paper on «Liquidity», I, 13-14). And this is why we can indeed have downward movements of income as an effect of hoarding in the form of bank deposits, but these depressive effects are not so automatic or so certain as is alleged in certain macro-economic conceptions, such as those advocated by Prof. Schneider.

III - The Point of Error.

1. — To appreciate this, it appears necessary to go back to the root of the disagreement, where, in my opinion, lies an actual «error». In other words, we must determine whether indeed there is no flaw in «Keynes' argument» that, in effect, the money supply (including bank deposits of all kinds) is determined exclusively by the monetary authorities, or whether instead that principle constitutes

the «Achilles' heel» of Keynesian doctrines, in that the supply of deposits, as I maintain, is determined also by the public as a whole acting as creditor of the banking system, as «lender» to the banks, and not only as «borrower» from the banks.

This involves reviewing some points of the discussion which went on for so many years on the question of the «creation» of bank deposits, and bringing it up to date. In this connection, it seems rather strange that, in the recent development of macro-economics, new models keep being devised on the basis of «Keynes' argument», without their authors' stopping to consider whether it is, in fact, unassailable.

2. — It should be recognized that, in defending this argument, Schneider is in excellent company: he is not the only one to feel that the argument constitutes the quintessence of the recent «theory of credit». We are dealing with an «assumption» which, by dint of having been repeated over more than thirty years by eminent economists, is generally considered to be beyond dispute. To appreciate this, it will suffice to refer to Robertson who, as Stamp put it, unobtrusively laid the egg, which was then hatched by Keynes.

In «Banking Policy and the Price Level» of 1926 (and the later edition of 1932), Robertson set out to demonstrate that:

«the public as a whole cannot directly determine the size of the aggregate of bank-deposits, which lies mainly at all events within the discretion of the banks» (p. 52-53).

Upon this thesis he then based the «third proposition» of his «Theories on Banking Policy» of 1928 (reproduced in the «Essays» of 1940), to the effect that:

«the banks determine how much money shall be outstanding, but it is the public which determines, through the habits which it adopts as regarding the hoarding and spending of money, what the amount of money shall be worth».

And upon this very proposition rests the Keynesian system as regards the determination of the money supply, and the conse-

quences inferred as to liquidity preference. This can be seen from the emphasis laid by Keynes on that proposition, which he translated into the following terms (Chap. 14 of the «Treatise»):

«the volume of cash-balances depends on the decisions of the bankers and is created by them: the volume of real balances depends on the decisions of depositors and is created by them».

This has opened the way for the idea that the public can influence the «value» of the deposits by varying their velocity of circulation, but cannot influence their «volume», which is claimed to depend mainly and in all circumstances upon the discretion of the banks and especially on the policy of the Central Bank.

3. — This whole structure, however, was built upon a groundless premise: the premise, as laid down by Robertson in his «Theories»:

«that for the most fundamental purposes of monetary theory, we can without serious risk of error, speak as though the bank deposits subject to cheque were the only form of money, ignoring the existence of paper notes and metal coins» (pp. 40-41 of the «Essays»).

The «risk of error» inherent in such a scheme is instead quite serious. This scheme, instead of highlighting the basic lines of the operation of the banking system, altogether suppresses one of the essential features of any system of deposit banks: it leads to denying any possibility of converting deposits into paper notes, and paper notes into deposits, while it is through this channel that the public can make its influence felt, as creditor to the banking system, on the volume of deposits (5). Under this scheme, that influence of the public is excluded not because it does not exist in reality, but because the scheme is so designed as to prevent any possibility of showing that influence: the conjurer's hat is seen to be empty because the rabbits were left out before the trick was

(5) I have fully discussed this particular point in a paper on *Risparmio abortivo* (Abortive Saving), in «Giornale degli Economisti», August 1936, reproduced in *Problemi della politica creditizia* (Credit Policy Problems), Milano, 1948.

performed. In other words, the structure of this scheme is not «wrong» — in fact, we must recognize that it is quite adequate to show the influence of the banks on the aggregate volume of deposits, to the same extent that the experiment of dropping objects in a vacuum bell shows the influence of gravity. But just as it would be erroneous to infer from the experiments conducted in such a medium that atmosphere has no influence at all (even if a negative one), it would likewise be erroneous to infer from that scheme that in practice the public does not also exert an influence on the aggregate volume of deposits.

4. — Robertson himself, in setting forth his conceptions on a more realistic basis, considers that in a normal banking system it is always possible to convert deposits into banknotes and vice-versa. And then he recognizes that the public can indeed influence the volume of deposits, by distributing its cash balances as between the two components thereof: deposits and banknotes. He does explicitly admit this in a paragraph of «Money» (1922 and later editions), concerning the «relation of deposits to common money outside bank reserves» which reads:

«the relation between bank money and common money depends only in part on the more or less arbitrary and conventional decisions of bankers regarding their reserves: it depends also partly on something more fundamental, though not unalterable — the business habits and preferences of the community» (p. 59 of the 1948 edition).

However, this acknowledgment, which is frequently made by advocates of «Keynes' argument», does not induce them to reject the argument or even to qualify its validity (6).

(6) A typical case is that of SAYERS who, in *Modern Banking*, 1937 (3rd. edition, 1951), after having stressed the influence exerted by the preferences of the public on the reserves covering deposits, then turns round and positively denies that the public can influence the aggregate volume of deposits. In his opinion, the influence of the public is most felt in the distribution between cash deposits and saving deposits: «the banks decide the volume of deposits, but the public, directly at least, decides the distribution between the Cash Deposits and Saving Deposits categories» (p. 254).

In fact, he infers from this that, as the amount of Cash Deposits is determined by the state of trade and habits of the

What these authors do is to limit sharply the scope of that acknowledgment, as though the public's choice between deposits and banknotes were determined only by the need for common money: as though it were a matter of deducting (by « leakage ») from the amount of deposits created by the Banks at their discretion so much as the public may need for its payments depending on the state of the trade and on habits and customs relating to such payments. And by adopting this limitation, it is assumed that the choice between deposits and common money is practically irrelevant.

Robertson assumes this explicitly: for him, even though (as we have seen) the behaviour of the public is « not unalterable »:

« there exists at any time a certain proportion, depending on the habits and customs of the people, between the volume of payments ordinarily made in common money... So long as these habits remain the same... the proportion between the volume of common money put into circulation and the volume of bank deposits will tend to remain unchanged ». (*loc. cit.*, p. 58).

The inference is drawn from this that while the ordinary banks as a whole, in the case of a substantial increase in their lending, would see their reserves just as substantially curtailed, on the other hand the central bank, through the increase in circulation, could increase deposits indefinitely, so that the behaviour of the public in its choice between deposits and common money would be irrelevant. And this is what Schneider explicitly maintains, in stating that:

« the public can influence only a change in payment customs and habits. If the public decides to make more payments other than in cash, greater quantities of cash remain in the credit system and

public as regards payments (as indicated in the text), even the aggregate amount of saving deposits is controlled not by the depositors, but by the Banks: « If the Banks have determined the total of all deposits and the total of cash deposits is determined by the state of trade..., then the total of saving deposits is automatically determined — for saving deposits are by definition all deposits minus cash deposits. The total of saving deposits is not directly controlled by the bank's customers at all. In fact, given the state of trade, etc., in which the volume of cash deposits is implicit, the banks themselves determine the volume of saving deposits when by their operations in acquiring assets they determine the volume of all deposits » (pp. 255-256).

the credit potential increases, if the behaviour of the central bank remains unchanged. Such changes in payment customs, however, take place very slowly: therefore, in the framework of a theory relating to short periods only, we can disregard the expansion of the credit potential by this way. In countries where payments other than in cash are already widely used, this phenomenon has practically no importance » (p. 11).

5. — This argument, however, takes into consideration only one of the many « motives » for demanding money in general, and at the same time for making a choice among the various types of money to be demanded; it considers, in Keynesian terminology, the « transactions-motive » only. Furthermore, with regard to the elementary money demand formulas given by Keynes (Chapter 14, II, of the « General Theory »), it considers only the function connecting money demand to income [$M_1 = L_1 (Y)$], disregarding the relationship between money demand and the interest rate [$M_2 = L_2 (r)$]. This is unwarranted, for those motives and functions relate both to money in general and to each type of money. All the motives must be taken into account, both when considering the public's propensity to hold money in general, and when considering the public's propensity to hold deposits or banknotes, and hence the relation between these two propensities *i.e.* when considering the public's preference in the choice that it makes unceasingly between deposits and banknotes. In its practical developments, this choice is determined also by the action of the interest rate, which is disregarded if we consider only the « transactions-motive », and which instead must be kept clearly in mind when dealing with deposits especially since « time deposits » and « saving deposits » are included among the latter as a whole.

6. — All this, we repeat, is inferred from Keynes' own theoretical system. But the same inference can be drawn also from the « Cambridge Quantitative Equation » in the integral formulation given by Pigou in « The Value of Money » of 1917 (7), and simplified by

(7) Originally published in « The Quarterly Journal of Economics », No. 32, and reproduced in « Readings in Monetary Theory », London, 1952.

Keynes in « A Tract on Monetary Reform » of 1923 (Chapter III, 1).

This version by Keynes brings out the fact that the money demand shows itself both in the propensity to hold banknotes (k) and in the propensity to hold deposits (k'). And the choice between deposits and banknotes thus depends upon the relation between the two propensities ($\frac{k'}{k}$), the determination of which is therefore quite involved and cannot be achieved by considering only the « leakages » related to the need for cash payments.

7. — Because of the complex nature of the factors involved, the question of whether or not the public's behaviour in regard to the credit it intends to extend to the banking system (through the choice between deposits and banknotes) is in practice irrelevant, cannot be solved on an axiomatic basis. There is no warrant for considering as unassailable « Keynes' argument » stating that money (including deposits) has a zero elasticity of production in respect to the public's liquidity preference. And we are not warranted in asserting on the basis of that argument that the saving channelled into bank deposits automatically acts, under any circumstance, as an income-depressing factor.

Nor can the presupposition of the « practical » irrelevance of the public's behaviour in the choice between deposits and banknotes be held valid on the basis of a general reference to the expanded use of deposits in the most advanced countries. As for any other « practical » observation, we must produce positive proof on the basis of ascertainable facts.

Only the test of facts can tell us whether the substantial differences that unquestionably exist between banking and monetary customs in the various countries are such as to warrant a different view of the factors which determine the volume of deposits, or whether instead, as I maintain, these substantial differences are reflected only in the different « weight » to be attributed to the influence of the individual factors involved. This means giving up the « confused and confusing » battle of words on the creation of deposits and resorting instead to concrete

statistical measurements designed to yield, in quantitative terms, a more precise idea of the influence of the different « levers » of monetary and credit policy.

IV - Statistical Assessments.

1. — For England, a study of this kind was conducted in 1934 by Meade in *The Amount of Money and the Banking System* (8), using the statistical material published in the Macmillan Report for the years 1925-1930.

Among other things, Meade studied the variations during that period of the ratio (q) which expresses the proportion of money held by the public in the form of banknotes, and noted that this ratio changed from 14.8% in 1925 to 12.7% in 1930, averaging 13.7% over the six years. He then calculated what variation would have occurred in the aggregate volume of money in existence (banknotes plus deposits of all kinds) as a result of a variation in the said ratio, the other factors involved remaining unchanged. He pointed out:

« how sensitive the amount of money is to changes in q , the proportion of their money, which the public hold in the form of notes... if q had increased from 13.7 per cent to 14.7 per cent, the total amount of money would have decreased by about 4 per cent ». (« Readings », *loc. cit.*, p. 61).

Meade expressed the hope that similar studies could be made for other countries and other periods of time, but as far as we are aware this was not done. Furthermore, to our knowledge, attention has not been drawn to the results of that study which did not at all confirm the then very common assumption that the public's behaviour has very little effect on the volume of deposits and of money in general.

2. — On my part, even before I knew the study by Meade, I had tried to do something of that kind with special reference to Italy and some comparison with the United States of America. After a study on « The

(8) « The Economic Journal », No. 44, reproduced in « Readings », *cit.*

Reserve Ratio » published in 1952 (9), I made a survey on the « Reconstruction of Bank Deposits in Italy » (10), in which I endeavoured to convert into elementary formulae the general arguments I had developed in previous studies regarding the creation of deposits. I shall confine myself to setting forth here, with some comments, those formulae in framing which I took into consideration particularly the need to arrive at a quantitative evaluation capable of deciding some questions as yet unsolved concerning the creation of deposits.

3. — In my studies I aimed at a twofold goal: (a) establishing the « virtual weight », in any country and in any period of time, of each of the elements which concur in determining the volume of deposits; and (b) establishing the « real weight » of each of these elements in a given country and in a given period of time. And I have taken as « determining elements »:

— the behaviour of the public as regards the credit it extends to the banking system;

— the conduct of the banks as regards the credit they extend to the public;

— the policy of the Central Bank, as regards the amount of banknotes and deposits (on the Central Bank itself) created; the amount hereafter referred to, in brief, as « claims on the Central Bank ».

The behaviour of the public as a whole can result in variations in the aggregate of deposits, directly and explicitly, only insofar as it is reflected in a definite choice between deposits and banknotes, and precisely in the « degree of preference » shown by the public for deposits over banknotes. This « degree of preference » (K_p) is expressed by the ratio of the absolute volume of deposits (D) to the amount of banknotes in the hands of the public (B_p) (11). In the last analysis, this ra-

(9) *La Copertura dei Depositi*, in « *Bancaria* », April 1952. Reproduced in *Questioni di Teoria e Tecnica Monetaria* (Issues of Monetary Theory and Technique), Padua, 1953.

(10) *La Ricostruzione dei Depositi Bancari in Italia*, in « *Moneta e Credito* » (Banca Nazionale del Lavoro), No. 24, IV Quarter of 1953.

(11) In addition to banknotes we must consider deposits, if any, held by the public on the Central Bank: *i.e.* we must consider the whole of the « claims of the public on the Central Bank ».

tio corresponds to the ratio between the coefficient k' and k of the « Cambridge Quantitative Equation » (See para. II, 6). Therefore:

$$(a) \quad K_p = \frac{D}{B_p} = \frac{k'}{k}$$

The conduct of the banks as a whole can result in variations in the aggregate of deposits, directly and explicitly, only insofar as it is reflected in the choice between credit extended to the public and reserves, and precisely in the « degree of liquidity » maintained by the banks through their lending policy. This « degree of liquidity » (K_b) is expressed by the ratio of the absolute volume of deposits (D) to whole of the « claims of the banks on the Central Bank » (B_b). Again, this ratio is nothing but the inverse of the « reserve ratio » (C), *i.e.* total reserves as a percentage of total deposits. Therefore:

$$(b) \quad K_b = \frac{D}{B_b} = \frac{1}{C}$$

The policy of the Central Bank can result in variations in the aggregate of deposits, directly and explicitly, through variations in the aggregate amount of « claims on the Central Bank » (B). Obviously, these claims are either in the hands of the public (B_p) or in the hands of the banks (B_b). Therefore:

$$(c) \quad B = B_p + B_b$$

We have thus three equations through which the absolute volume of deposits is determined univocally by the action of the three independent variables (K_p , K_b , B). From the three equations, we can obviously infer:

$$(d) \quad D = \frac{B}{\frac{1}{K_p} + \frac{1}{K_b}} = \frac{B}{\frac{1}{K_p} + C}$$

4. — It is needless to say that in this expression (d) we find nothing but the elements we have put in by the preceding formulae (a), (b) and (c). Therefore we find no reference to price levels, which we have purposely disregarded in view of the arguments deve-

loped on other occasions (12) showing that the influence of the banks (and of any other « determining element ») can make itself felt on the volume of deposits independently of any rise in the price level, more or less inflationary in nature. This rise, while on the one hand it can promote the formation of « forced saving », can also render purely nominal, and therefore illusory, the formation of a greater volume of deposits. In this connection it should be borne in mind that while the creation of a greater volume of deposits can take place without the formation of « forced » saving, it can likewise take place without the formation of new « genuine » saving. True, the flow of fresh savings into the Banks is one of the elements that can result in a variation in the aggregate of deposits, but the latter can and do normally vary without corresponding variations in the aggregate of real assets « saved » (13).

In any event, saving — be it « forced » or « genuine » — can make its influence felt on the absolute volume of deposits only to the extent that it expresses itself in a variation of the public's degree of preference. And this is just what the formula set forth above tells us.

5. — That formula also tells us something essential for the ascertainment, in quantitative terms, of the « virtual » weight and of the « real » weight of each determining element. It tells us in which direction and to what extent each of the three elements, considered separately, can by itself (*i.e.* the others remaining unchanged) vary the absolute volume of deposits by direct influence of its own variations. Two considerations must be kept in mind.

In the first place, we should not lose sight of the fact that in passing from the

(12) Particularly in para. 7 of *La Creazione dei Crediti Bancari* (the Creation of Bank Credit), in « *Giornale degli Economisti* », August 1935 (Reproduced in « *Problemi* », *cit.*).

(13) On this point I have repeatedly insisted in my previous papers on the subject, including that on « *Liquidity* » (II, 10) to which Schneider referred. He evidently misunderstood me, in asserting that « according to Gambino, a greater amount of saving is the necessary premise for expanding credit. Here is concealed the dominating conception of the old theory of credit, *i.e.* that the extension of credit depends in some way upon saving activity; in fact, that the quantity of credit available is limited by the amount of saving » (*Interesse e quantità di moneta*, etc., p. 11).

expressions (a), (b) and (c) to expression (d), we have assumed (as explicitly indicated) that K_p , K_b and B are independent variables. But in practice they are not independent: the behaviour of each element affects the others to some extent. Thus, for instance, the policy of the Central Bank affects the public's behaviour and the banks' conduct: an increase in the amount of banknotes (and other claims on the Central Bank) inevitably increases the amount of banknotes in the hands of the public and/or the banks; the public is normally « induced » to increase the credit extended to the banks in the form of deposits, and/or the banks are normally « induced » to increase the credit granted to the public in the form of loans. This may reflect itself in the degree of preference and/or in the banks' reserve ratio. Likewise the behaviour of the public may affect the conduct of the banks and even the policy of the Central Bank, and so forth.

Each element, therefore, exerts a twofold influence on the volume of deposits: on the one hand, a direct and immediate influence which derives from the variations of the element considered, and on the other an indirect and mediate influence which derives from the variations « induced » in the other elements. Our formula does permit us, as indicated, to ascertain in quantitative terms the direct influence of each element, but we cannot expect to use it to indicate also the indirect influence, which by its nature is not susceptible of univocal determinations with the same degree of certainty as the direct influence.

6. — In the second place, it should be borne in mind that, in adopting as an index of the behaviour of the public [in expression (a)] the « degree of preference » (*i.e.* the ratio between deposits and banknotes in the hands of the public), we assume that such behaviour will not change as long as the ratio remains unchanged. This ratio, however, can remain unchanged even in the presence of any variations, in absolute figures, in the amount of deposits, *i.e.* of credits extended by the public to the banks. And likewise, in adopting as an index of the conduct of the banks [in the expression (b)] the « re-

serve ratio», we assume that such conduct does not change even in the presence of any variations, in absolute figures, in the amount of loans, *i.e.* credits extended by the banks to the public and consequently in the amount of reserves.

This is also consistent with current usage: we are certainly not used to saying that the banks change their conduct as long as they keep unchanged the reserve ratio (and the loans/deposits ratio), even if in absolute figures the amount of reserves (and conversely of loans) increases to a lesser or greater extent. And yet, whenever the volume of deposits increases concurrently with an increase in the amount of claims on the Central Bank, the degree of preference and the reserve ratio remaining unchanged, the increase in deposits is attributed exclusively to the Central Bank, even if it involves, as it must, the contribution of the public (*i.e.* an increase, in absolute figures, in the amount of credit extended by the public to the banks) as well as the contribution of the banks (*i.e.* an increase, in absolute figures, in the amount of credit extended by the banks to the public).

Therefore, the expression (a) and (b) from which we started, and consequently the formula (d) which we inferred therefrom, make « explicit » only part of the influence which the public's behaviour and the conduct of the banks exert upon the volume of deposits. They leave « implicit », that is, the influence relating to the absolute variations in credits extended by the public to the banks and by the bank to the public — variations which are always necessary for an increase in deposits, even when they do not translate themselves into variations in the ratios adopted to express the choices of the public and of the banks.

Taking all this into consideration, our formula makes it possible to ascertain only the « direct and explicit » influence of each « factor » as we had initially indicated (IV, 3). This limitation must be borne in mind, particularly when ascertaining to what extent a given variation in deposits should be attributed to this or that factor (14). But since we

(14) Thus, in the paper on *La ricostruzione dei depositi*, etc., — intended to reject the thesis, fairly common in Italy, and representing the opposite extreme as compared to Schnei-

must now determine whether or not the public's influence actually affects the aggregate of deposits, the validity of the positive results reached is obviously strengthened, and certainly not impaired, by the knowledge that we are leaving aside an essential part of that influence.

V - The Results Achieved.

1. — Having thus clarified what we can expect from formula (d), it should be noted that the latter, in connecting the volume of deposits (as a dependent variable) with as many as three elements (as independent variables), does present some difficulty of application. Among other things, it does not lend itself to a geometrical representation, which is feasible only if no more than three variables (dependent and independent together) are involved.

Hence the desirability of breaking it down into two separate expressions: one intended to represent the « consistency level » of deposits (L), *i.e.* the ratio between total deposits and total claims on the Central Bank, and the other intended to represent the « absolute volume » of deposits.

We then have:

$$(e) \quad L = \frac{D}{B} = \frac{I}{\frac{I}{K_p} + C}$$

$$(f) \quad D = L \cdot B.$$

These expressions show the usefulness of keeping a definite distinction between « consistency level » and « absolute volume » of deposits, with regard also to the various elements which determine them. The « consistency level » is determined exclusively by

der's, that the Central Bank does not influence the volume of deposits — I indicated that about two thirds of the increase in deposits during the six years ending with 1952 is attributable to the policy of the Central Bank. I also stressed (*ibid.*, IV, 4) that « the formation of deposits, also for the portion attributable to the Central Bank, always involves the contribution of the banks and the public ». I explained how this contribution, normally « induced » by the variations in the amount of the claims on the Central Bank remains « implicit » until such time as variations occur in the banks' reserve ratio or in the public's degree of preference.

the public's degree of preference and by the banks' reserve ratio, while the absolute volume is determined also by the aggregate amount of claims on the Central Bank.

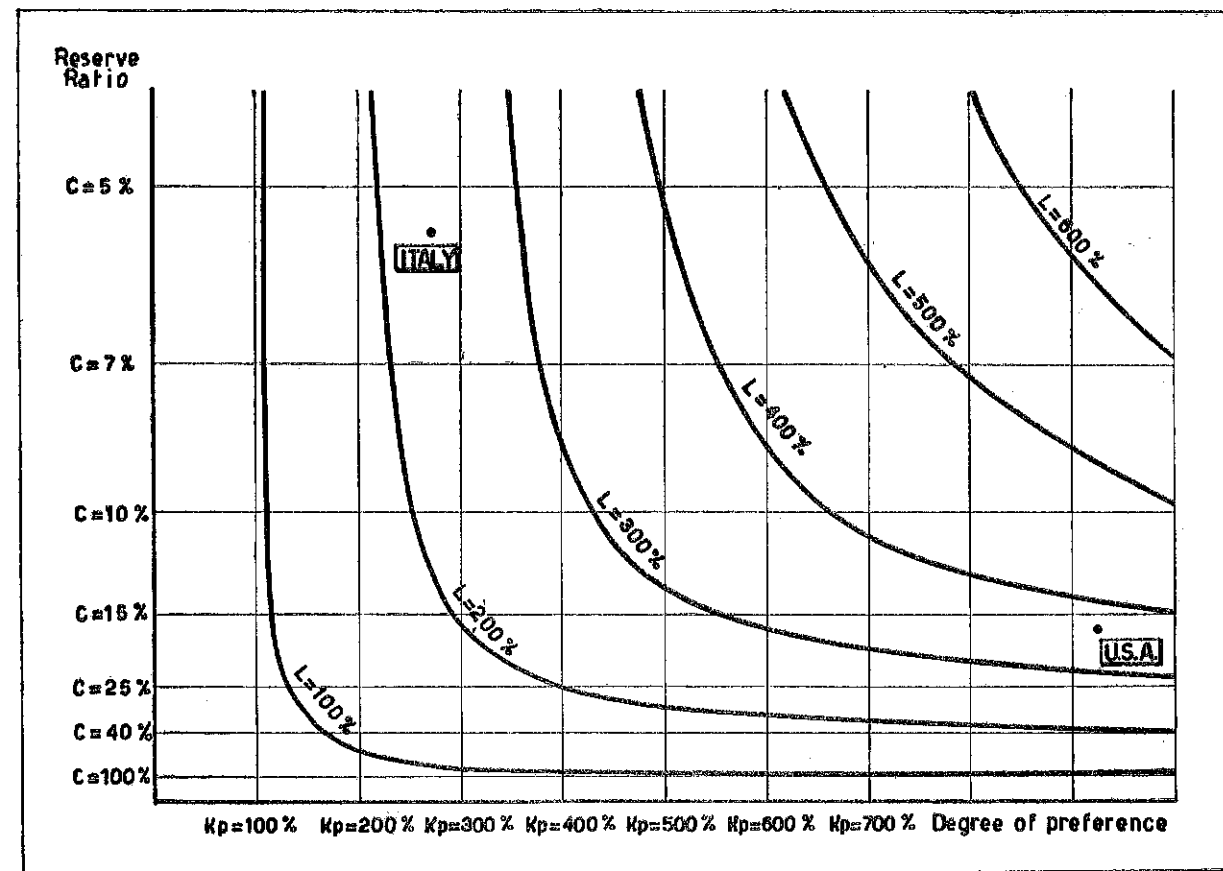
These expressions make it possible to represent separately the consistency level and the absolute volume of deposits by means of appropriate three-dimensional diagrams. Con-

positions of the two factors and the virtual position of their product.

In Diagram 1 (15), we have shown, between the curves of the virtual positions of the consistency level, two « real » points, marked ITALY and U.S.A., which represent the actual positions in Italy and in the United States at the end of 1938.

DIAGRAM I

CONTOUR MAP OF VIRTUAL POSITIONS OF FACTORS DETERMINING CONSISTENCY LEVEL OF DEPOSITS



sistency level can be represented like the altitude curves in conventional maps, in a three-dimensional diagram, showing horizontally (abscissae) the public's degree of preference and vertically (ordinates) the banks' reserve ratio. To each given pair of values of both « factors » univocally corresponds, as « product », a given consistency level.

Thus the diagram indicates for each consistency level the different pairs of values of the two factors which may produce that level: in other words, it shows the univocal connection between the infinite « virtual »

As it can be seen, the Italian consistency level at the end of 1938 equaled 237 per cent of the claims on the Central Bank. This level was determined univocally, because the public preference degree was then 272 per cent, and the banks' reserve ratio was 5.42 per cent. At the same time, the U.S. level of consistency equaled 347 per cent, made up by a preference degree of 919 per cent, and a reserve ratio of 17.94 per cent.

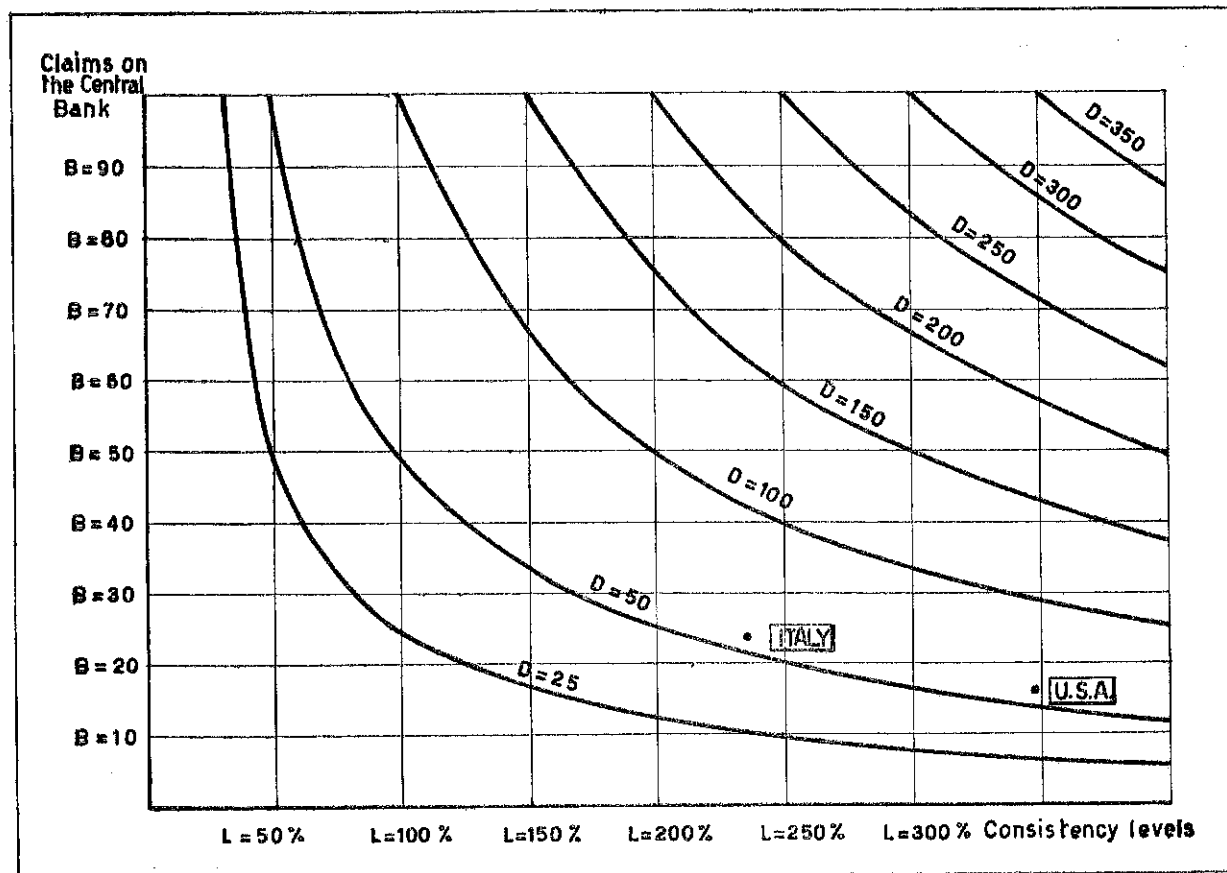
(15) For the figures on which this, and the following charts are based, see the paper on *La Copertura dei Depositi*, cited above.

In a similar manner we can portray (as shown in Diagram II) the absolute levels of deposits, by substituting them for the consistency level on the horizontal plane, while the claims on the Central Bank are shown vertically in the place of the banks' reserve ratio.

2. — Both diagrams, but particularly that of consistency levels, reveal a rather significant fact as to the « virtual » weight of the individual factors: namely, that each factor does not have, by itself, a determined weight — the influence of a given variation of each of them is more or less relevant not

DIAGRAM II

CONTOUR MAP OF VIRTUAL POSITIONS OF FACTORS DETERMINING ABSOLUTE VOLUME OF DEPOSITS



In this diagram too we have shown, between the curves of the virtual positions, the « real » positions of Italy and the United States at the end of 1938. We can thus see that at that date Italy had a volume of deposits aggregating 57.1 billion Lire (consistency level, 237 per cent; claims on the Central Bank 24.1 billion lire), while in the United States the volume of deposits aggregated \$ 54.1 billion (consistency level 347 per cent; claims on the Central Bank \$ 15.6 billion).

only according to its own position, but also according to the position of the other factor. Depending on the respective position, each factor may tend to become « limitational » in that it tends to limit, if not even to preclude, any increase in the consistency level or absolute value of deposits, regardless of the variations of the other factor, which then tends to become « irrelevant ».

This possibility is only virtual as regards the absolute volume of deposits. In effect, the reciprocal position of the factors which

determine that volume are not usually such as to render « irrelevant » the variations in the consistency level, and even less those in the claims on the Central Bank. This can be seen, from the second diagram, looking at the position of Italy and even more at that of the United States in 1938. On the other hand, the possibility outlined above may be not only virtual as regards the consistency level. This can be seen from the first diagram, looking at the positions of Italy and of the United States in 1938. In Italy's position, an increase in the reserve ratio would have then been almost irrelevant: any rise in the consistency level would have been the result of an increase in the public's degree of preference. On the other hand, in the United States an increase in the degree of preference would have been almost irrelevant: a rise in the consistency level would have come chiefly from a decrease in the reserve ratio.

3. — It can thus be inferred that, depending on a shifting of the reciprocal positions of the elements involved, the actual influence directly and explicitly exerted by the public on the volume of deposits could, in given borderline cases, become irrelevant. But under what circumstances could these borderline cases occur?

The increasingly widespread use of deposits in the most advanced countries leads us to assume that, as the public's preference degree increases, the influence of the banks' reserve ratio, and, as a result, the influence of the claims on the Central Bank, will become more appreciable. Therefore, the influence of the behaviour of the public would become less and less relevant *as compared* to the influence of the banks' conduct, and chiefly as compared to the influence of the policy of the Central Bank. This does not mean, however, that even if we confine ourselves to considering the direct and explicit influence, the influence of the public's behaviour will become *irrelevant by itself*, in absolute terms. And this is what matters in regard to the problem under discussion.

4. — In my first study on *La copertura dei depositi*, in ascertaining the positions referred to above in the U.S. in 1938 (with the approximation then permitted by a summary elaboration of the data available), I also evaluated (II, 17) the shifts which had taken place in those positions between 1938 and 1950, as compared to Italy's positions. I arrived at the conclusion that developments in the situation had considerably narrowed the gap between the two countries, so that in the United States by 1950 the influence of the public's behaviour had become far more important than in 1938.

In the second study on *La ricostruzione dei depositi, etc.* I ascertained on the basis of more abundant facts and with greater accuracy, that — even considering only direct and explicit influences — the behaviour of the public accounted for nearly one third of the increase in the volume of deposits in Italy during the six years ending with 1952, although in that period the circulation had increased to such an extent as to almost treble the claims on the Central Bank (from 660.3 to 1,850.7 billion lire). The data are shown in the following table:

INCREASES IN ABSOLUTE VOLUME OF DEPOSITS, BY DETERMINING FACTORS IN ITALY (1947-1952)

Year	Behaviour of the public		Conduct of the banks		Policy of the Central Bank		Total (Billion Lire)
	Billion Lire	% of total	Billion Lire	% of total	Billion Lire	% of total	
1947	58.7	17.0	66.4	19.0	339.8	98.0	347.5
1948	153.3	29.2	5.4	1.1	365.5	69.7	524.2
1949	195.2	46.8	63.2	15.1	284.6	68.3	416.6
1950	72.9	24.5	75.9	25.4	149.6	50.1	298.4
1951	103.9	22.6	23.8	5.2	379.8	82.6	459.9
1952	357.6	54.8	27.9	4.3	267.1	40.9	652.6
Total, 6 years	824.2	30.5	88.6	3.3	1,786.4	66.2	2,699.2

These results confirm for Italy what Meade had observed for Great Britain: « how sensitive the amount of money is to changes in the proportion of their money, which the public hold in the form of notes ».

VI - Conclusions.

1. — Therefore, the thesis that the public's behaviour does not appreciably influence the volume of deposits cannot stand up to the test of facts: instead, the influence exerted by the public, as creditor of the banking system, through the choice between deposits and banknotes, appears to be quite relevant, even if we consider only the direct and explicit influence (since only this influence is measurable).

Therefore there is much to be questioned about « Keynes' argument » that money (including bank deposits), has, under all circumstances « a zero, or at any rate very small, elasticity of production, so far as the power of private enterprise is concerned, as distinct from the monetary authority », so that the supply of money would be determined exclusively by the « deliberate » action of the monetary authority. In reality, the same preferences which influence the demand for deposits, such as « liquidity preference », on which so much emphasis is laid in the Keynesian system, as well as the particular preference which expresses itself in the choice between deposits and banknotes, act at the same time also on the supply of deposits. Also to this end, we should recall that, according to Pigou's felicitous expression:

« in the real world we cannot always hope to meet only with causes that act either on demand alone or on supply alone. The same cause may easily act upon both » (*loc. cit.*).

Thus we can well say, in my words quoted by Schneider, that « under the circumstances in which we now live, money too, like any other good, is produced according to demand » (pp. 9, 10).

Consequently, saving, even if hoarded in the form of bank deposits, does not automatically exert under all circumstances that income-depressing effect which is attributed to it by the doctrines with which I take issue. Hoarded saving, in involving an increase in the credit extended by the public to the banks, constitutes, explicitly or otherwise,

one of the conditions required for the banks to extend more credit to the public: rather than as a check, it acts as a stimulus to the banks' ability to extend credit. The point therefore remains, as expressed in another phrase of mine quoted by Schneider, that « in the stages of normal economic development, the banks are induced by the hoarding of individuals to expand their credit to the public, thus introducing such a corrective to the hoarding as to eliminate any depressive influence of the latter on income and economic conditions » (p. 9).

2. — We are thus back to what I wrote in the introduction: in the theories with which I take issue, the error lies in attributing general validity to schemes which have in effect a limited validity. In other words, the error lies in believing that the saving channelled through the banking system can automatically exert depressive effects, under all circumstances. This is a possibility which may come true only under special circumstances, and particularly in periods of recession and stagnation, because then the contribution of the other necessary elements of deposit creation may fail to act. Then, and then only, is a « deliberate » action of the monetary authorities required to prevent hoarded saving from becoming « sterile » or « abortive », causing or worsening cumulative downward movements income and business activity.

To this effect, in order to provide appropriate guidance for the monetary authorities, I believe that it would be most useful if someone could accept Meade's suggestion for continuing and extending in depth the quantitative studies intended to yield a better knowledge of the influence of the various levers of monetary and credit policy. On my part, I should like to express the hope that, here too, Prof. Schneider will contribute his theories and his experience to positive studies on the elements that have influenced the trend of bank deposits in Germany during the last few years.

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